VIESA®

ECOLOGICAL COOLERS

ECON

Installation Manual

www.viesa.ca / 1-888 438-8444

IMPORTANT

Installation requires an experienced mechanic with specific knowledge in the installation of the VIESA Ecological Cooler. Installation, disassembly, repairs and maintenance must be performed by an Authorized Installer. Authorized Installer must use proper protective equipment when installing the system.

Improper installation or use of unauthorized parts can cause malfunctions, loss of battery life or other consequences which may result in serious injury.

Manufacturer or Distributor will not be responsible for injuries or damages resulting from misuse of equipment, use contrary to operating instructions or installation by any person other than an Authorized Installer.

Information contained in this manual is subject to change. Manufacturer reserves the right, without notice, to make changes in equipment design or components as progress in engineering, manufacturing or technology may warrant.

World-wide Patents

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1- ECOLOGICAL COOLER

Function

VIESA Econ is a roof mounted cab cooler that delivers cool air to the truck's cabin using evaporative cooling and without running the truck's engine.

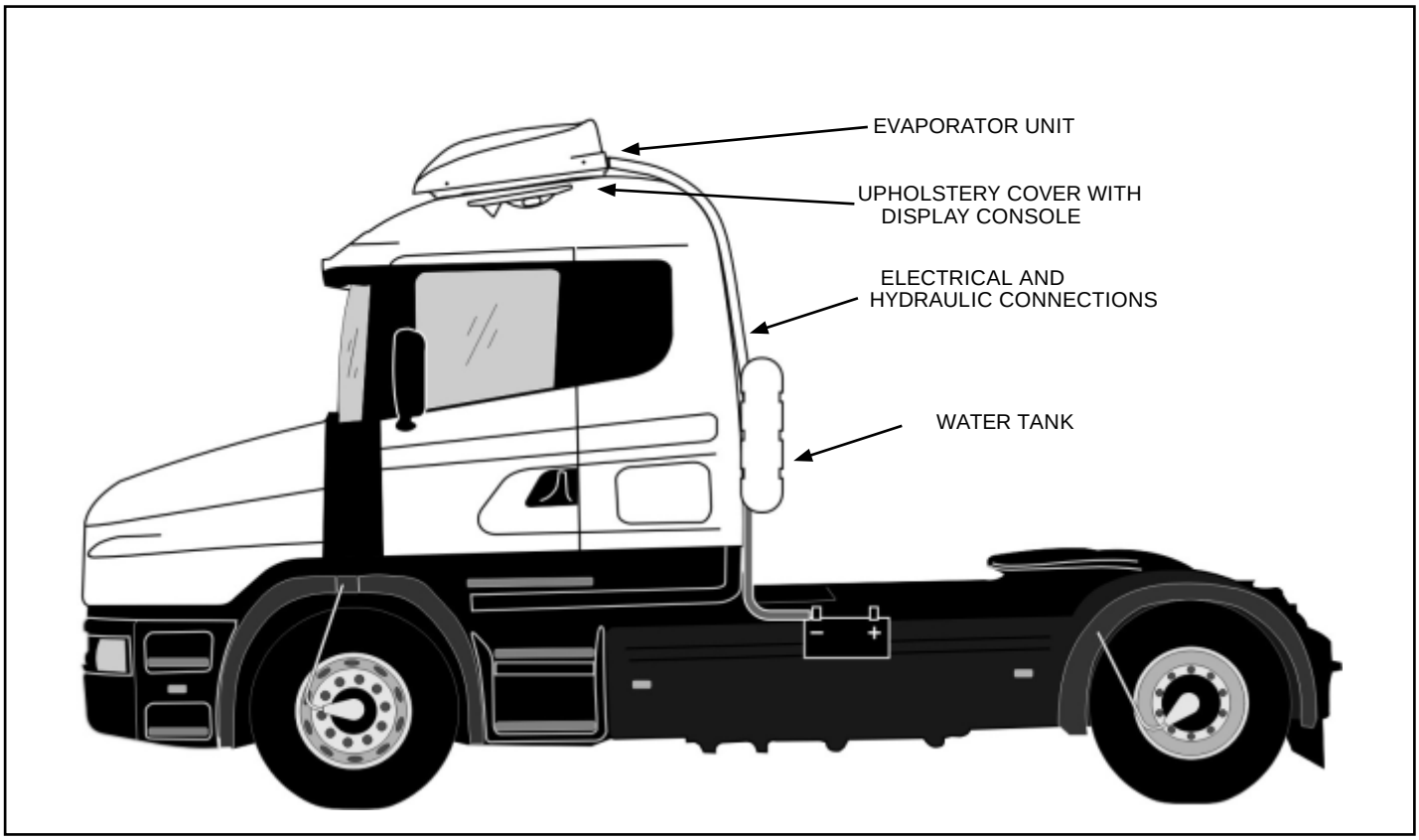
Operation

Cooling is generated by vaporized cool water delivered by a self-contained electrical motor. During operation it only consumes water and it makes no use of internal combustion engines, nor does it use chemical coolants or emit gases into the atmosphere. The unit is equipped with a water pump located in an auxiliary tank which takes water to the evaporator. A biturbo blower pushes the exterior air to the interior of the truck forcing the air through the evaporator and therefore cooling the warm air. The exceeding water backs to the water tank.

Application

Applied to any vehicle withan operating voltage of 12 V.

1.1- LOCATION OF PARTS AND COMPONENTS



1.2- TECHNICAL CHARACTERISTICS

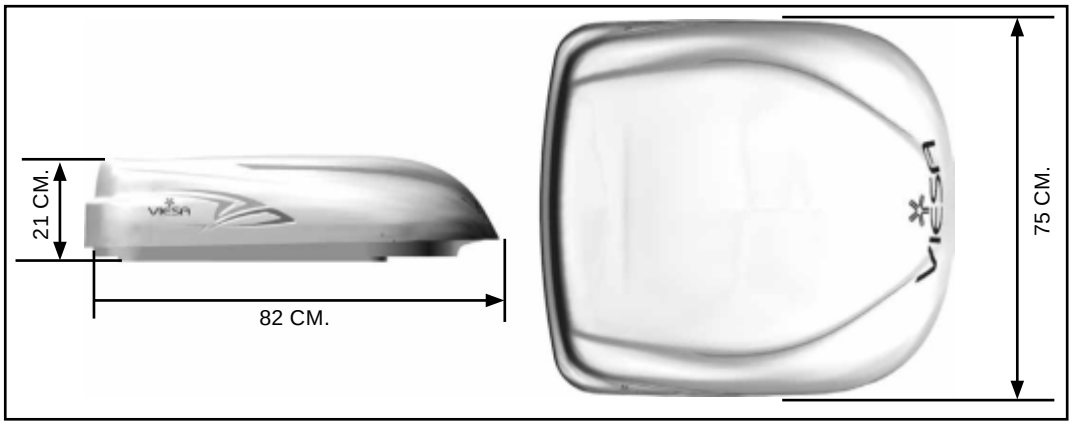
Aerodynamic external design
Evaporator unit cover with UV protection
Adjustable upholstery cover.
8- speed turbo blower
Distribution air ducts with airtight closure.
Turbo blower with sealed motor mounted on bearings
Designed and manufactured according to EMC (electromagnetic compatibility norm).
32-litre water tank with pump cover
Anti-spill water system
Water level sensor
Low water lever pump disconnection and alarm
Protection system for short-circuit in the pump and its connections
Automatic system disconnection under low battery voltage
Protection for high voltage
Fused main feed cable
Protection for polarity reversal
8 A per hour average consumption with turbine at maximum speed
2 to 5 liter average consumption of water per hour, depending on ambient humidity

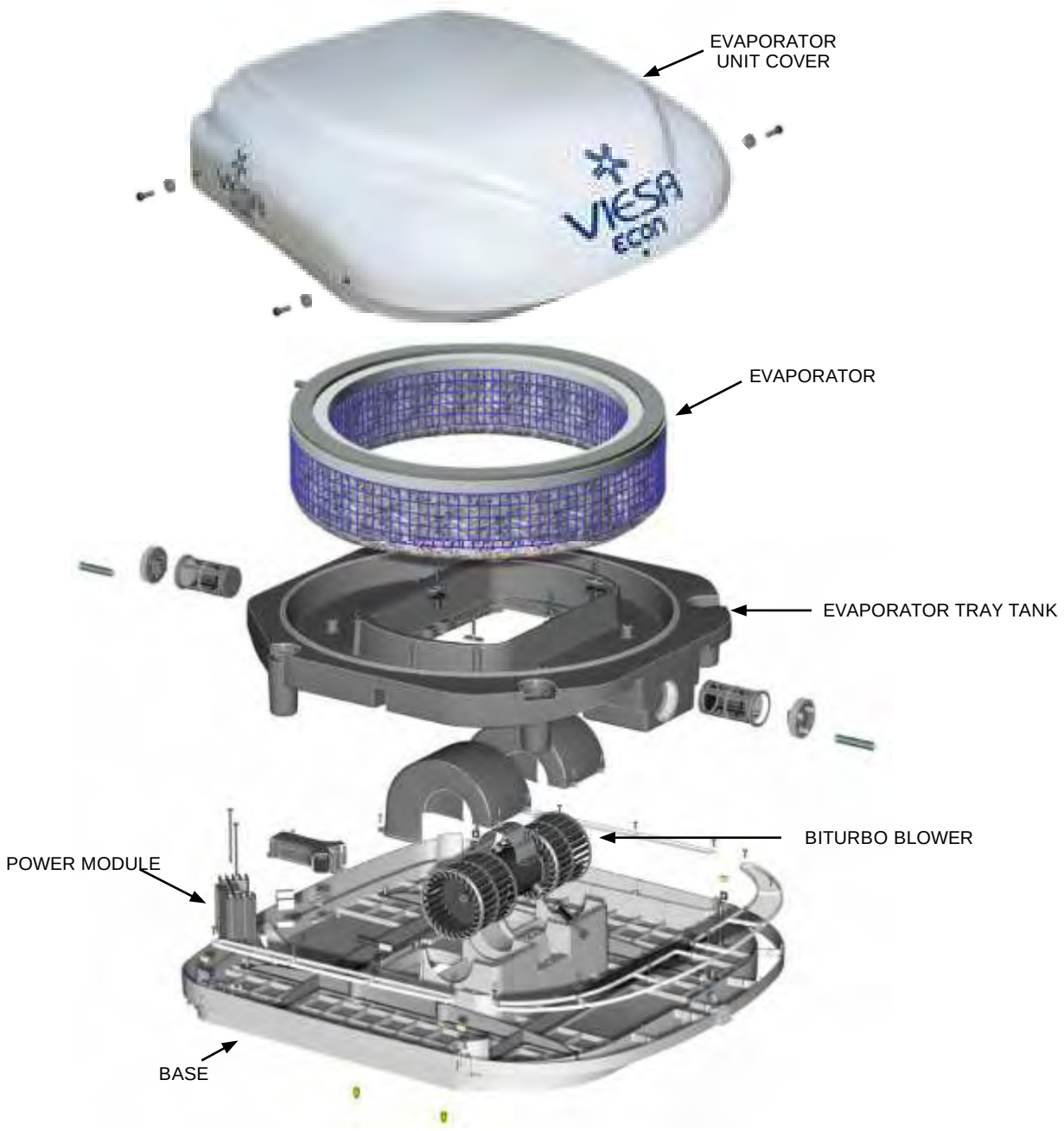
2- MAIN COMPONENTS

The equipment consists of an evaporating unit, electrical and hydraulic connections, an upholstery-cover and a water tank with pump.

Important: *Vehicle with equipment installed must not exceed maximum allowed height*

2.1- EVAPORATOR UNIT

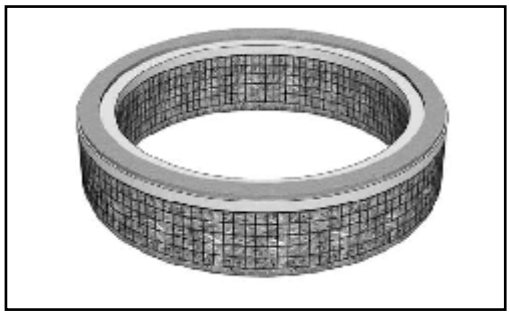




COVER OF THE EVAPORATOR UNIT

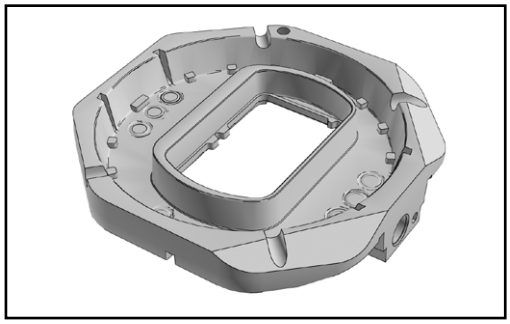
EVAPORATOR

Composed of two even distributed layers of special wood shavings.



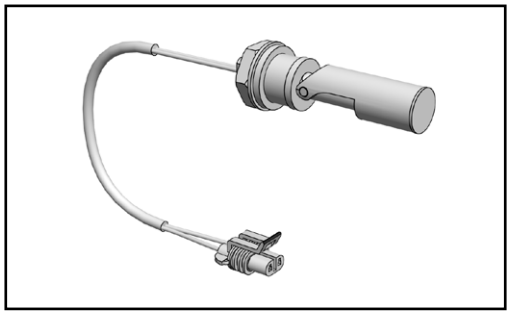
EVAPORATOR TRAY TANK

This element works as a water deposit and it collects the excess water that the evaporator receives. It allows the return of excess water to the water tank.



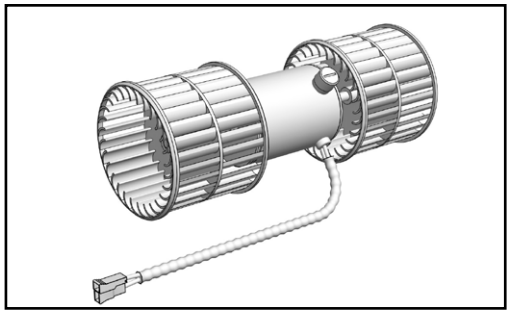
LEVEL SENSOR

Its function is to monitor permanently the presence of water in the tank, activating the water pump when the level is low.



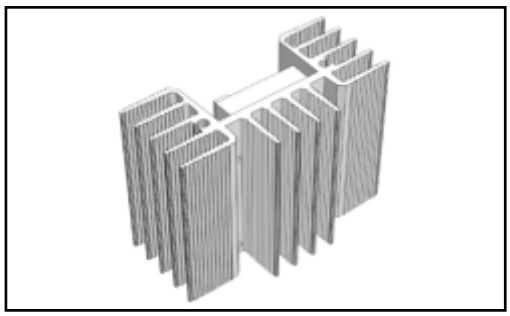
BITURBO BLOWER

It has two turbines which absorbs the air that comes from outside forcing it to the interior.
Maximum consumption is 7,5 A. in 12 volt-units.



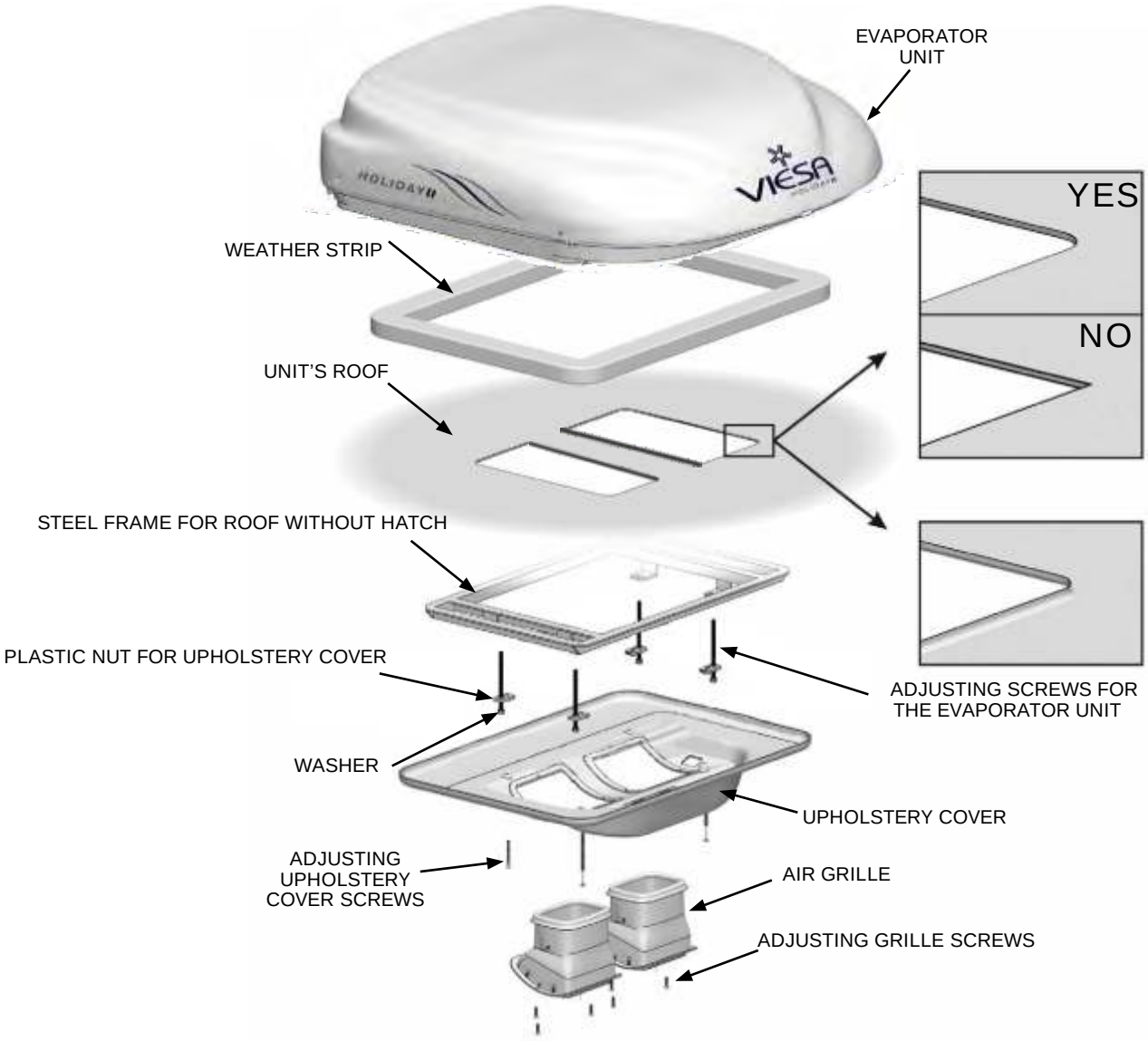
POWER MODULE

It controls the biturbo blower speed.



INSTALLATION PROCDURE

Units Without Hatch



⚠ DO NOT CUT ROOF OVER REINFORCING CHANNELS

a) Use Viesa`s Interior and Exterior Templates to cut the roof openings.

a.1) Determine the suitable place where the evaporator unit will be placed.

a.2) Mark the openings to be cut.

a.3) Check from the inside that no reinforcement channels or electrical wires will be cut.

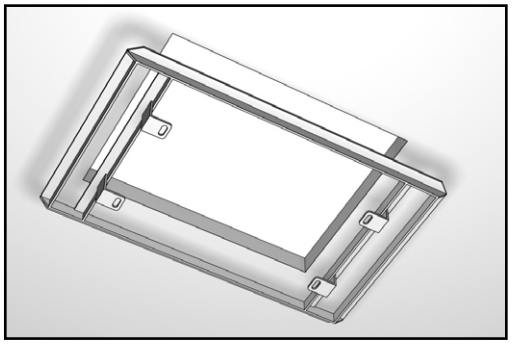
a.4) Cut the roof and shave any roughness.

Note: *When cutting, be carefull not to make right angles on the the corners. Corners must be round (see detail) in order to avoid future roof fissures.*

Important: *If the roof surface is a thin metal sheet, a 1cm. fold upwards has to be made all around the perimeter.*

b) Glue the weather strip to the base of the evaporator.

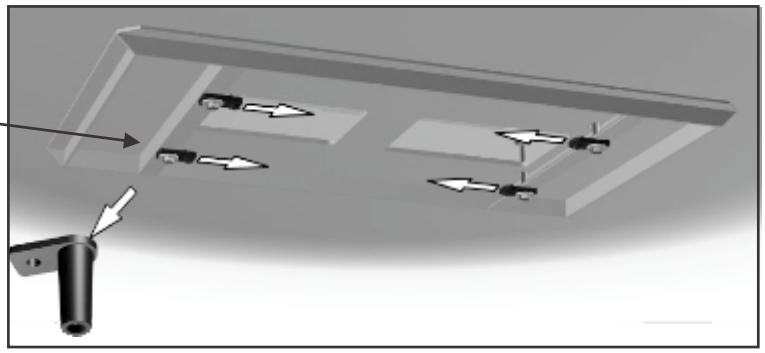
c) Apply silicone glue on the underside of weather strip so as to avoid water filtration.



d) Place and affix the evaporator unit to the roof.

e) Place the steel frame in the interior against the ceiling.

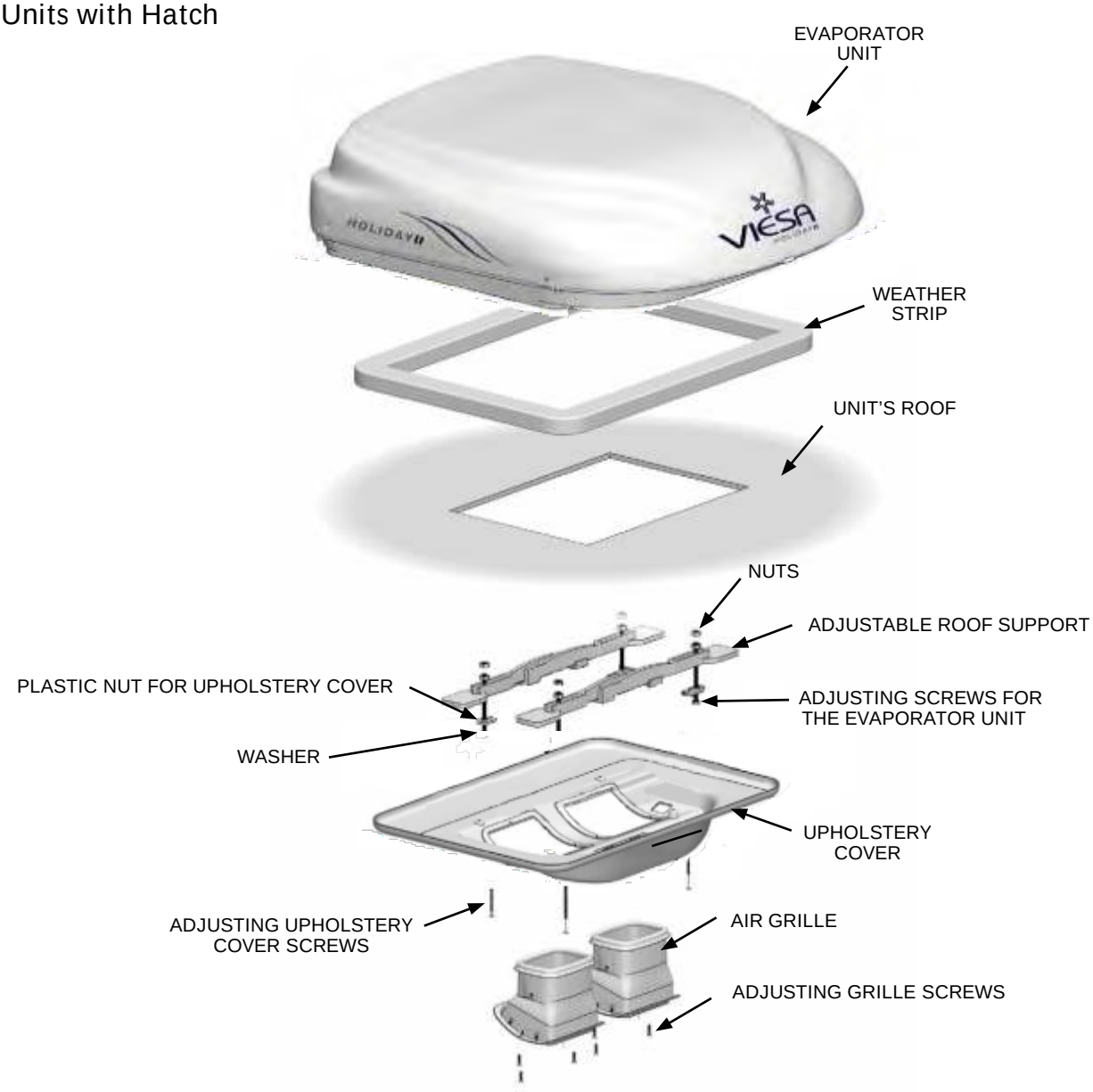
f) Use the 4 screws (changeable length in accordance with the thickness of the ceiling) and tighten until the weather strip is compressed to 10 mm. approximately.



Note: *If there is enough space, use a nut and locking nut between the underside of the roof and the base of the evaporator unit.*

Important: *In roofs without reinforcements some support must be provided in order to maintain rigidity to the cab.*

Units with Hatch



a) Remove the original hatch.

b) Glue the weather strip to the base of the evaporator.
Make sure weather strip will sit on the roof, not over the opening.

c) Apply silicone glue on the underside of weather strip so as to avoid water filtration.

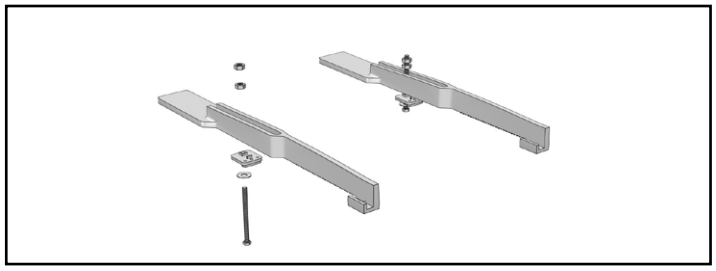
d) Place and affix the evaporator unit to the truck's roof.

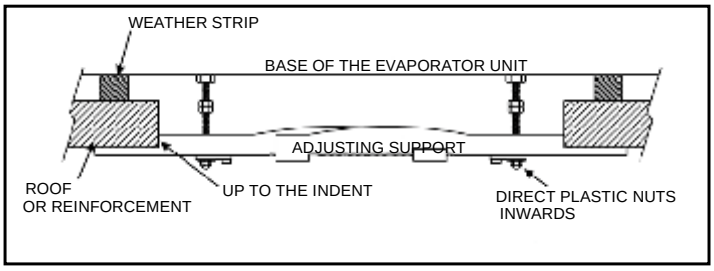
e) Place the adjustable roof supports in the interior against the ceiling.
f) Use the 4 screws (changeable length in accordance with the thickness of the ceiling) and tighten until the weather strip is compressed to 10 mm. approximately.

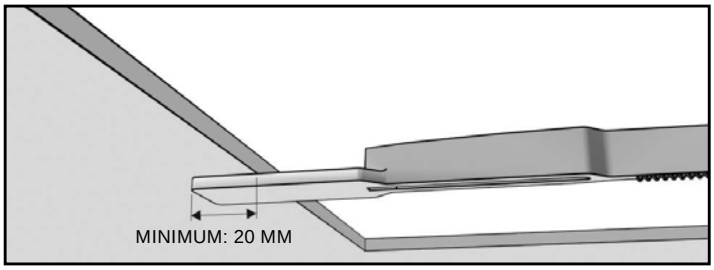
Note: *If there is enough space, use a nut and locking nut between the underside of the roof and the base of the evaporator unit.*

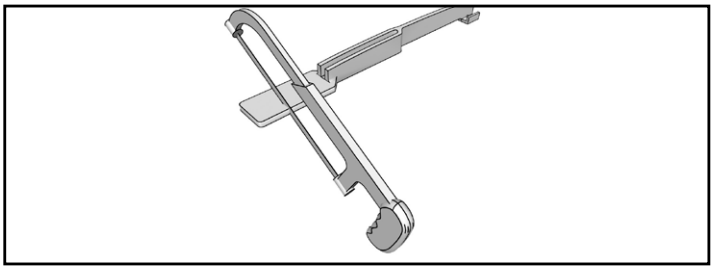
Note: *If the adjustable supports are to long, cut them at their ends.*

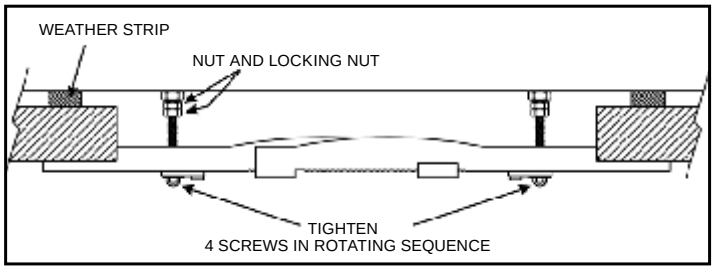
Important: *In roofs without reinforcements some support must be provided in order to maintain rigidity to the cab.*



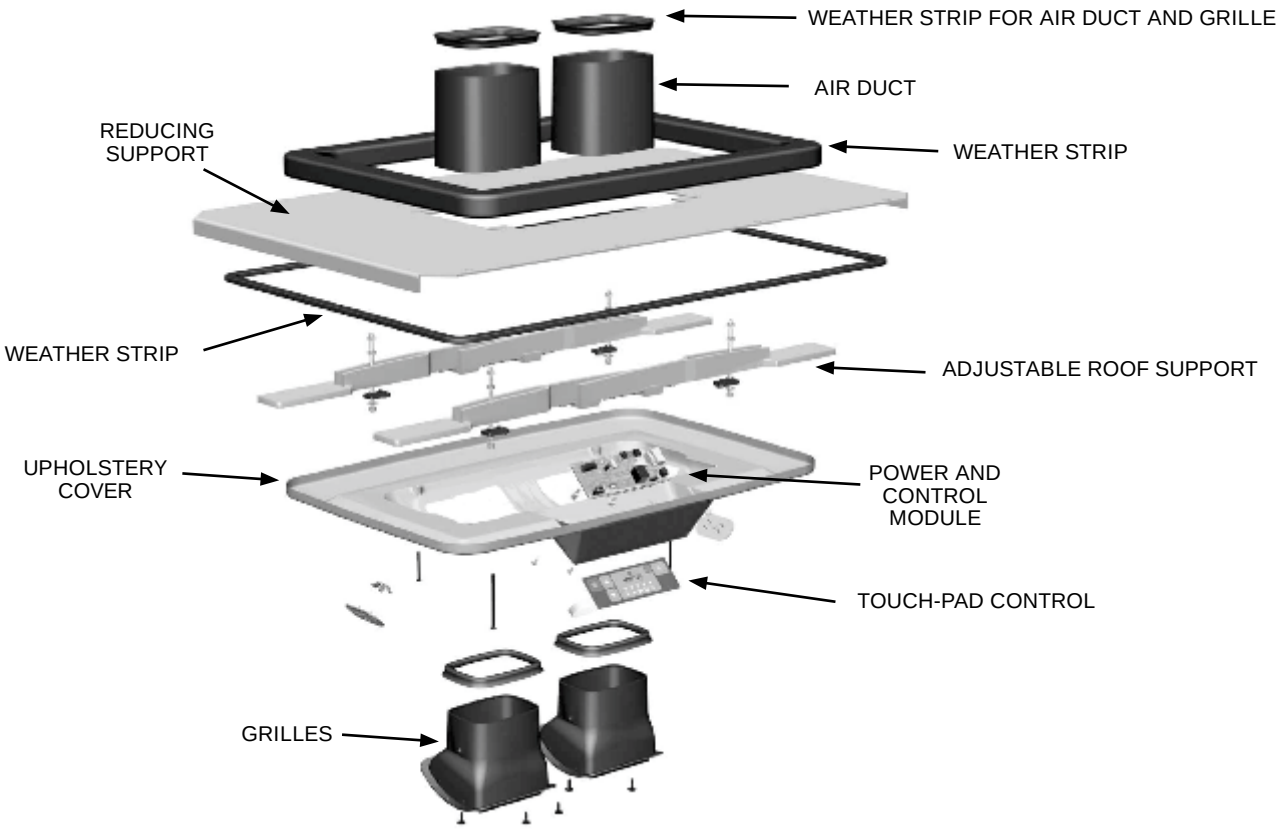








2.2- UPHOLSTERY COVER AND ACCESSORIES



2.3- POWER AND CONTROL MODULE

It allows the following operations:

To change the speed of the biturbo blower (up to 8 speeds)

To control the water pump cycles.

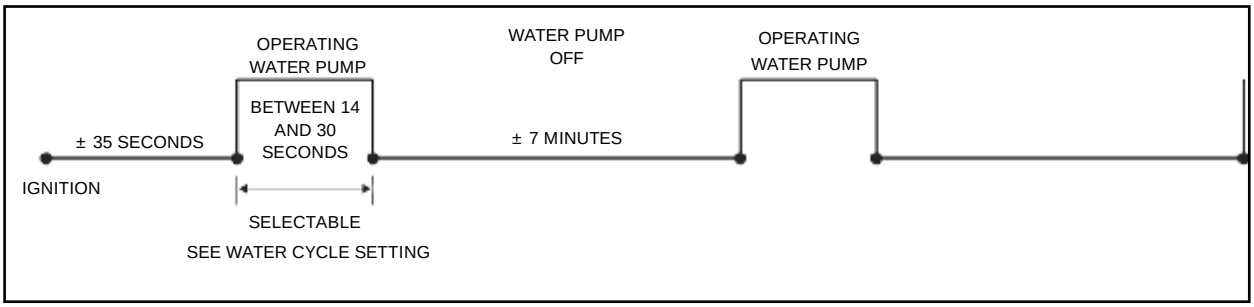
TECHNICAL CHARACTERISTICS

a) Protection for polarity reversal.
b) Protection for high voltage
c) Short-circuit protection in the water pump and in the biturbo fan and/ or in its corresponding electrical connections.
d) Automatic disconnection due to lack of water in the tank.
e) Working tension: 12 volts
f) Auto switch off for low battery tension

Note: *voltage is monitored at the battery terminals.*

CONTROL OF THE WATER

The module controls the operation of the pump cycle. It is showed in the following chart:



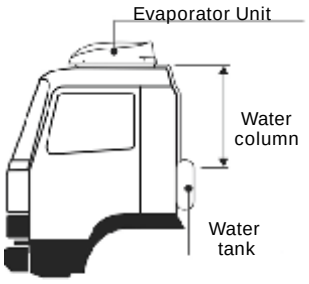
LOW WATER LEVEL SENSOR

It monitors the presence of water in the tank; if there is a lack of water, it informs the operator with a red LED indication and it stops the operation of the water pump automatically.

Note: *After replenishing the water tank the alarm will stop after approximately 3 minutes.*

Water Cycle Setting

Very important: *It is necessary to select one of the settings for the water cycle and according to the height of the water column. Without this setting the power and control module will not work.*



WATER COLUMN	USE KEY N°	WORKING TIME
0.40-1.20 mts.		20 Sec.
1.25-2.00 mts.		25 Sec.
More than 2.00 mts.		30 Sec.
		35 Sec. (Do not use)
		40 Sec. (Do not use)

Important: to change the setting after installation proceed as follows:

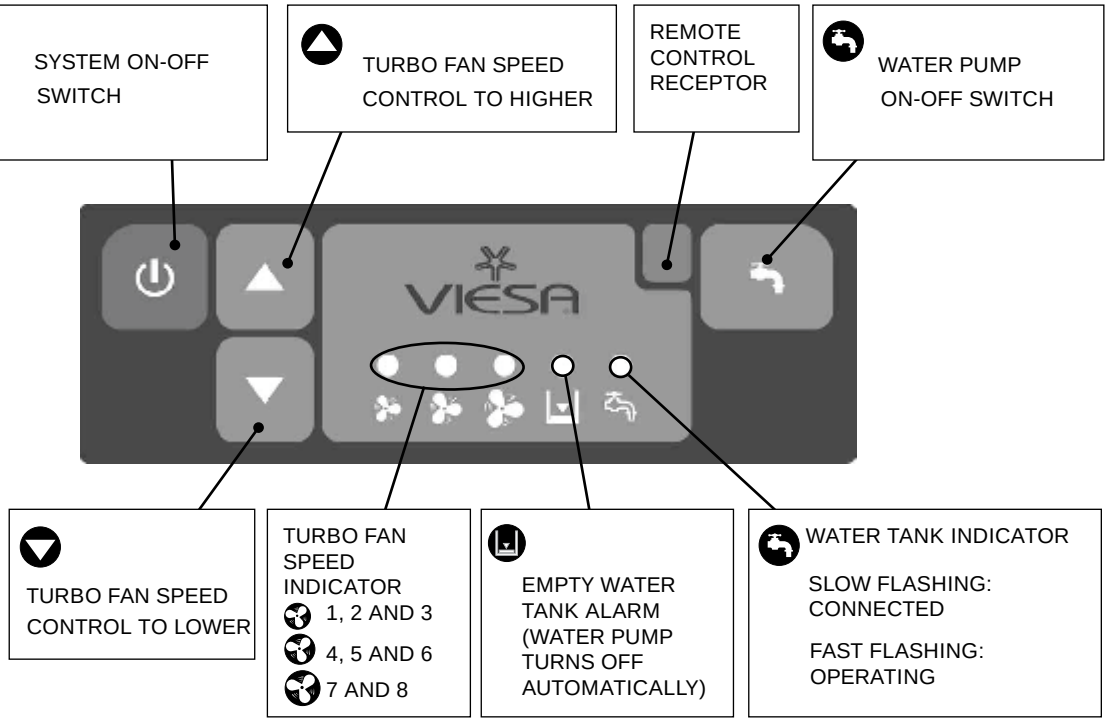
Remove the fuse or disconnect the main positive wire (+)
Activate the corresponding key
Place the fuse or connect the main positive cable (+)

2.4- BOARD INDICATIONS

Important: *before switching on the equipment:*

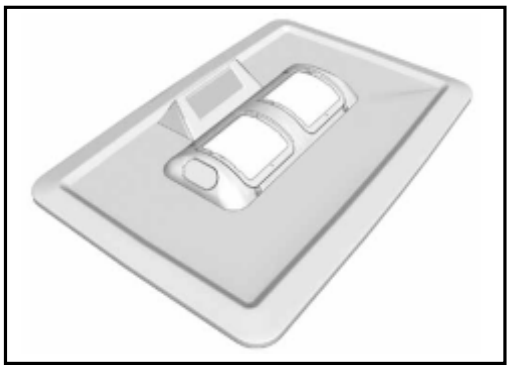
With parked vehicle: Open one of the windows 2 to 3 cms.
With the vehicle in motion: Open one of the windows 2 to 3 cms and close all other air entrances to the cabin so that hot air does not enter from exterior.

BOARD


SYSTEM ON-OFF SWITCH
TURBO FAN SPEED CONTROL TO HIGHER
REMOTE CONTROL RECEPTOR
WATER PUMP ON-OFF SWITCH
VIESA
TURBO FAN SPEED CONTROL TO LOWER
TURBO FAN SPEED INDICATOR
1, 2 AND 3
4, 5 AND 6
7 AND 8
EMPTY WATER TANK ALARM (WATER PUMP TURNS OFF AUTOMATICALLY)
WATER TANK INDICATOR
SLOW FLASHING: CONNECTED
FAST FLASHING: OPERATING

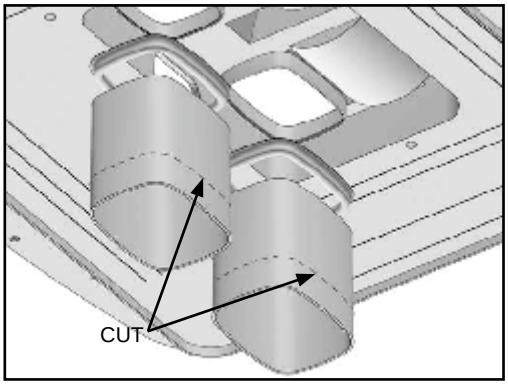
Note: *Keys must be held pressed for ± 1 second.*

2.5- UPHOLSTERY COVER



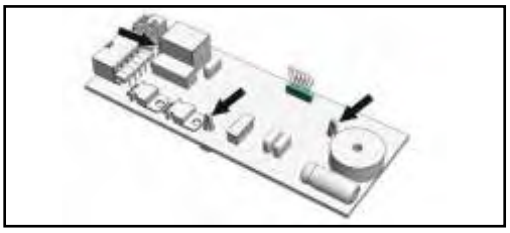
INSTALLATION PROCEDURE

1- Insert the weather strips into the evaporator`s base openings and push the air ducts (burr up) through the weather strips making pressure until they are firmly placed

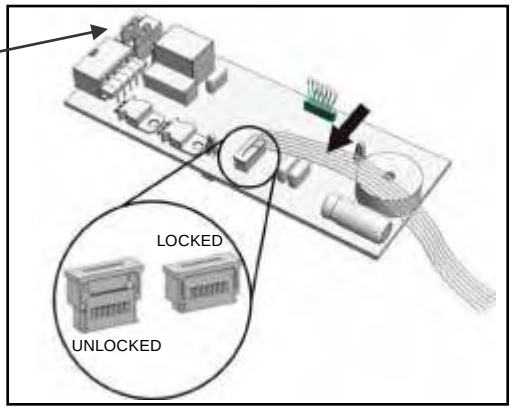


Important: *Cut the air ducts if needed.*
Air ducts 240 mm high can be ordered for very thick ceilings.

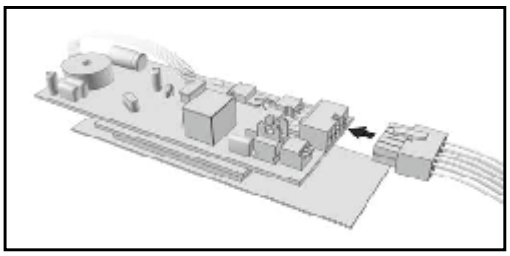
2- Attach the command and control module to the upholstery cover inserting the 3 locking pegs into their holes. Insert the ribbon cable as indicated in the figure (raise the connector head first, introduce the ribbon cable and then push down the connector head to lock).



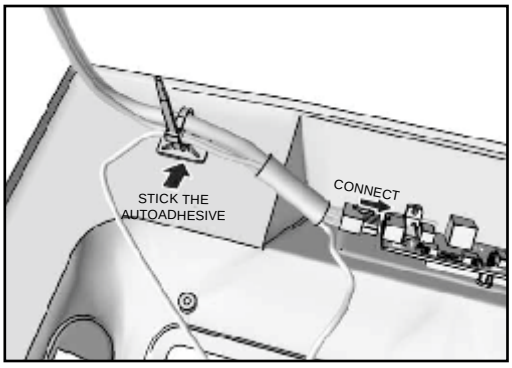
3- Locate the switch commanding the water cycle and set it according to the water column height.
(See Water Cycle Setting before)



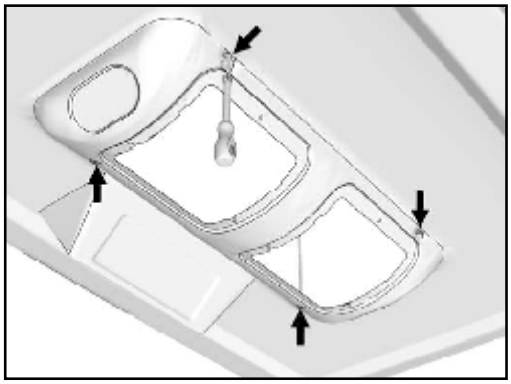
4- Connect the electrical installation to the command and control module.



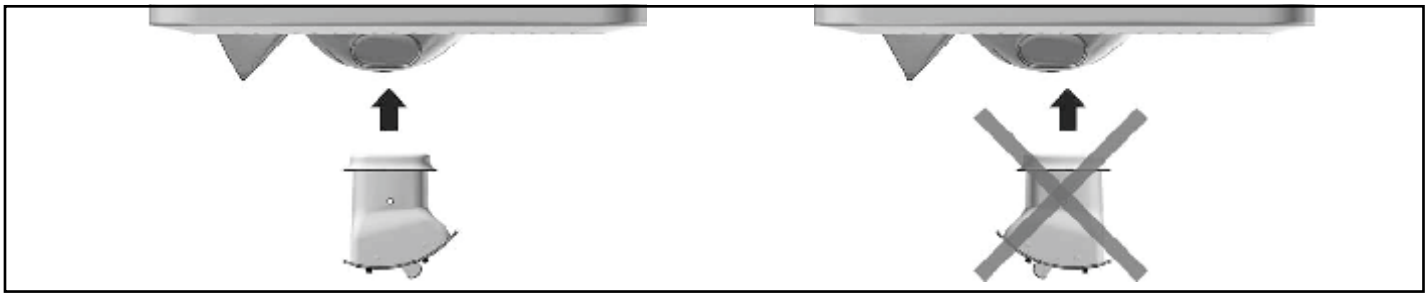
Note: Tie and stick the electrical installation to the upholstery cover with the provided tie.

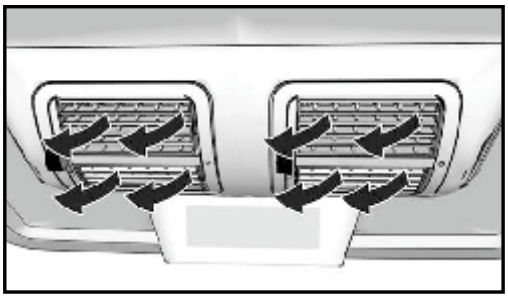


6- Place the upholstery cover with the display oriented to the front of the cabin.
7- Affix the upholstery cover with the 4 screws (without tightening.

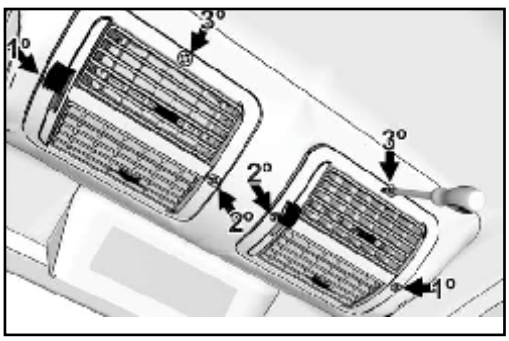


8- Introduce the air grilles with their weather strips.

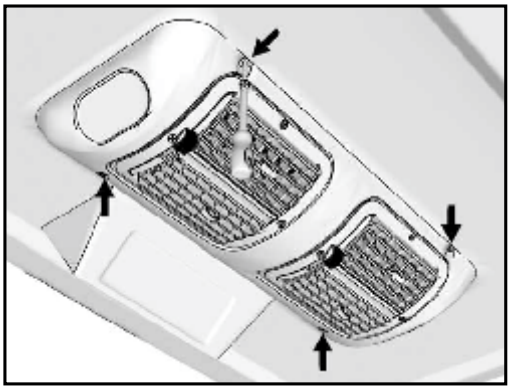




9- Fasten the air grilles to the upholstery cover with the screws, in the indicated sequence.



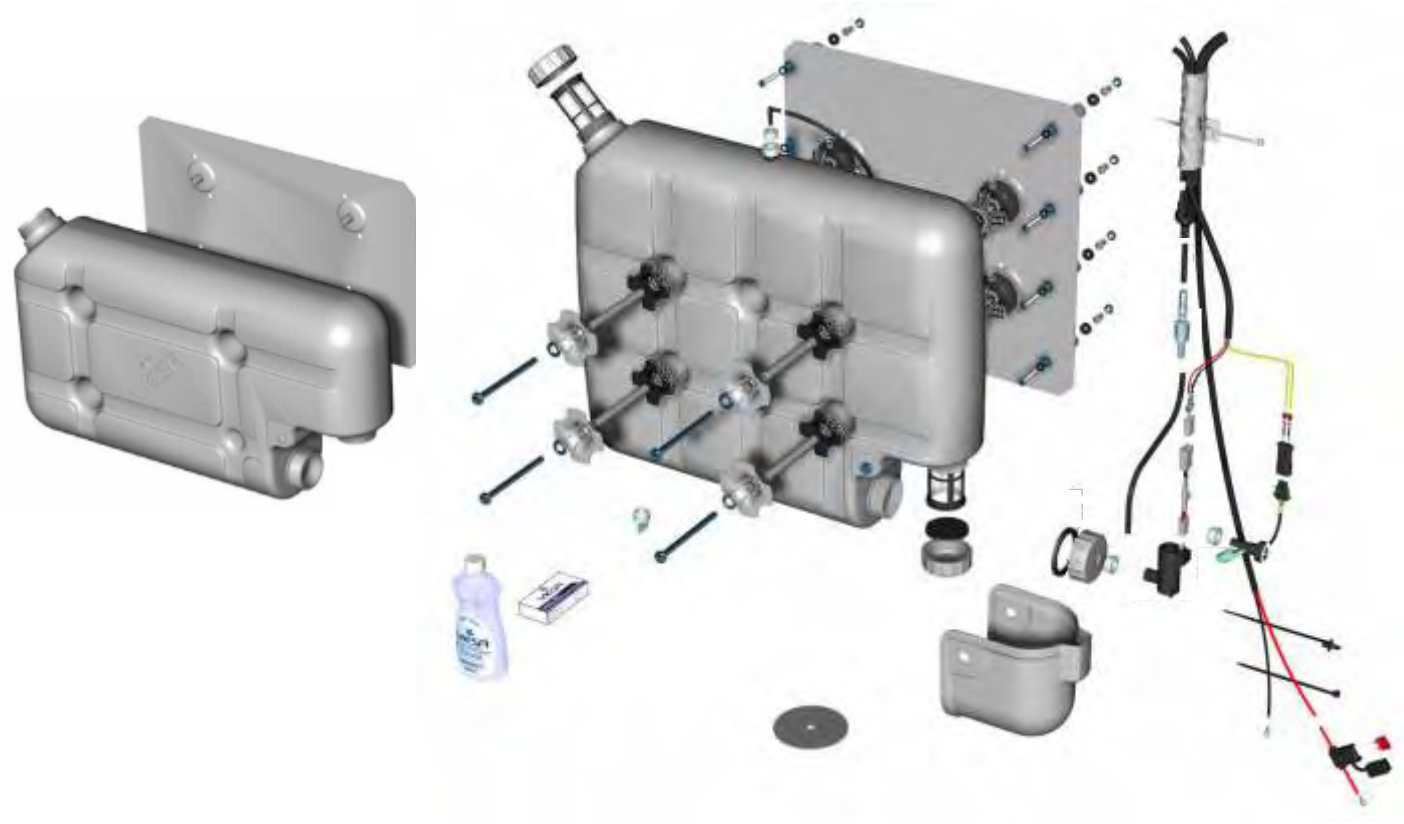
10- Tighten, without forcing, the 4 upholstery screws until covering the original upholstery without gaps.



2.6- WATER TANK

Placement

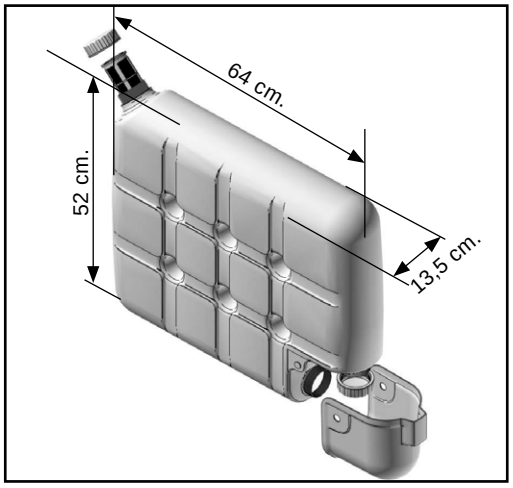
WATER TANK MODELS

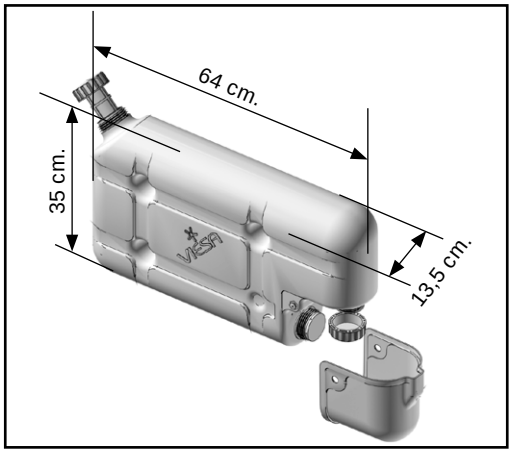


There are two models:

Standard: 32 litres. Dimensions: 64 x 52 x 13,5 cm.

Small: 20 litres. Dimensions: 64 x 35 x 13,5 cm.





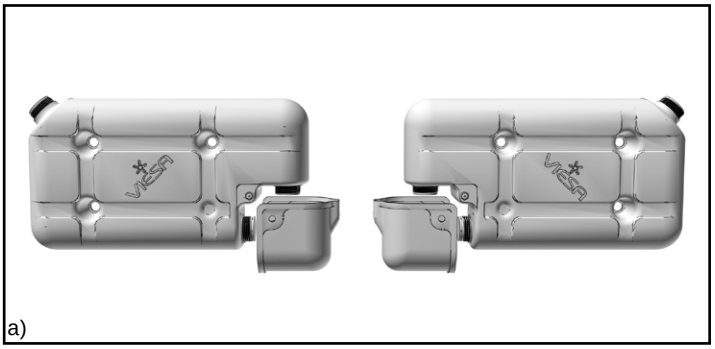
Made of a non translucent material which assures darkness inside and prevents fungi formation on the interior walls.
Resistant to vibrations and rapid changes in temperature.

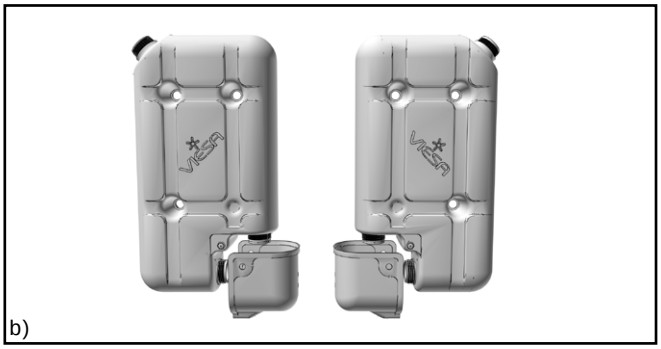
INSTALLATION

a) at the back of the cabin.
b) in the chassis.

note: *Do not place it near the exhaust pipe.*

Placing the tank horizontally (a) is preferred. Use vertical placement (b) only if not possible to place it horizontally.

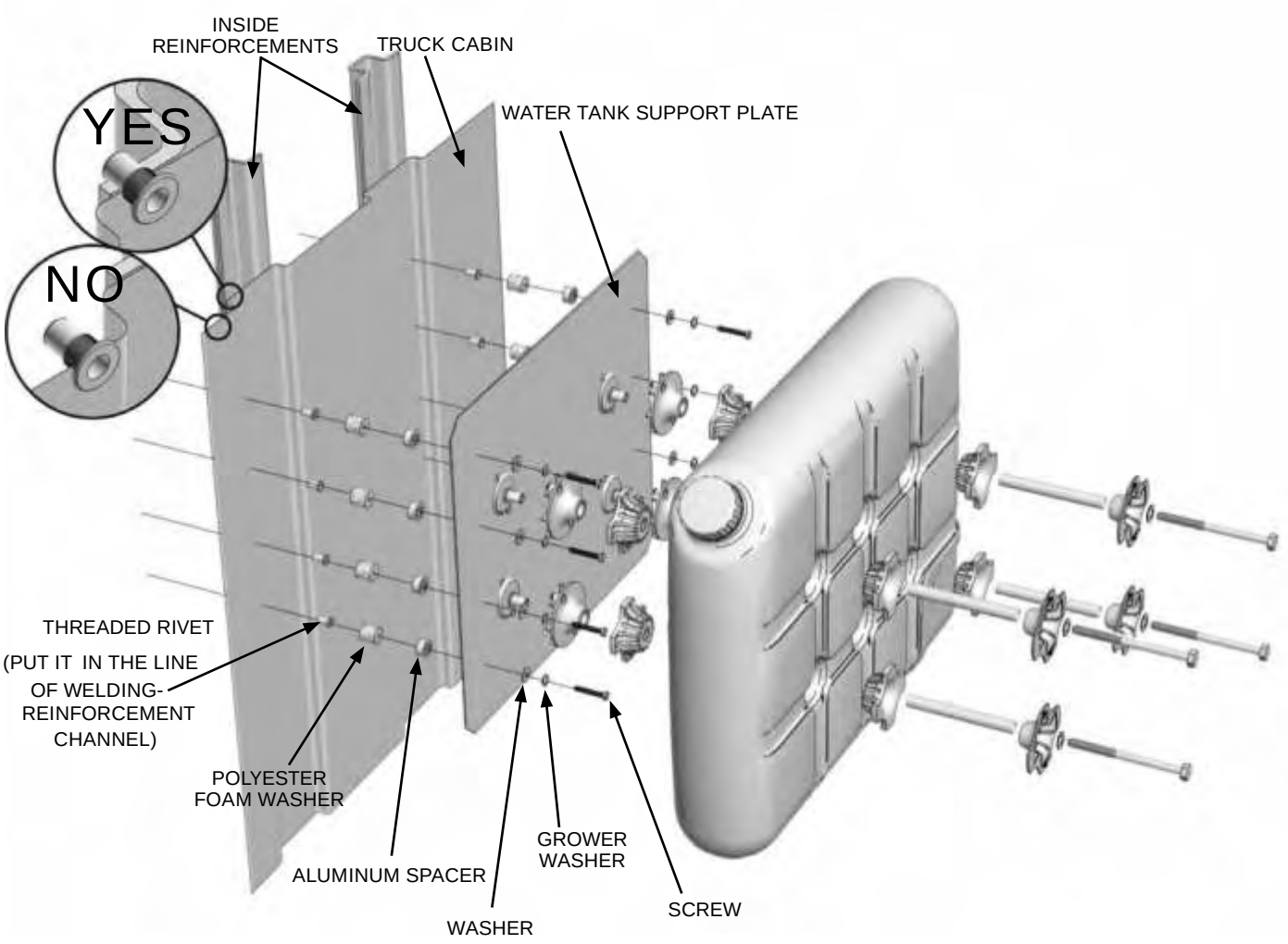

a)


b)

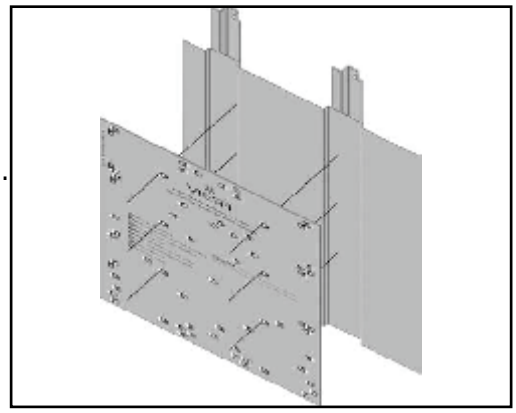
a)

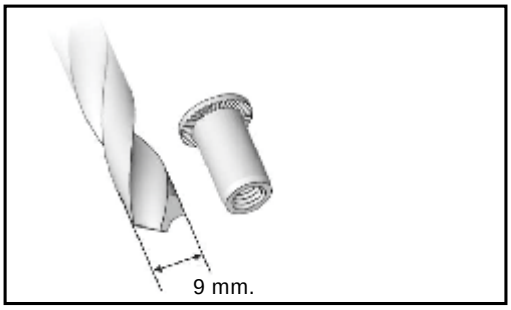
b)

VERY IMPORTANT:
NEVER APPLY TANK TO CABINS WITHOUT REIFORCEMENTS

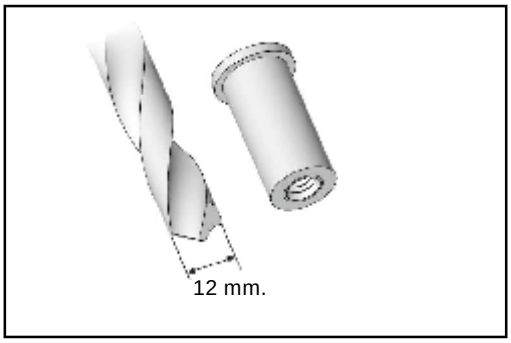


Identify the place on the rear part of the cabin where the tank will be installed.
Use the support plate to mark the points of attachment to the cabin. ALLWAYS OVER THE WELDING LINES prove with a 5 mm. diameter drill bit and then perforate with a 9 mm. drill bit.

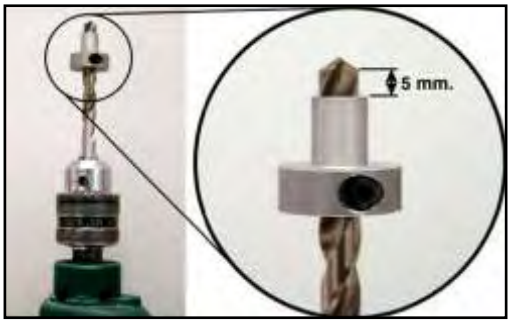




If using neoprene rivets, use a 12 mm. drill bit.
Neoprene rivets are used in units with fibreglass cabins.



Important: *When using the 5 or 9 mm. drills bits, use a depth stop, to prevent damaging the inside upholstery.*



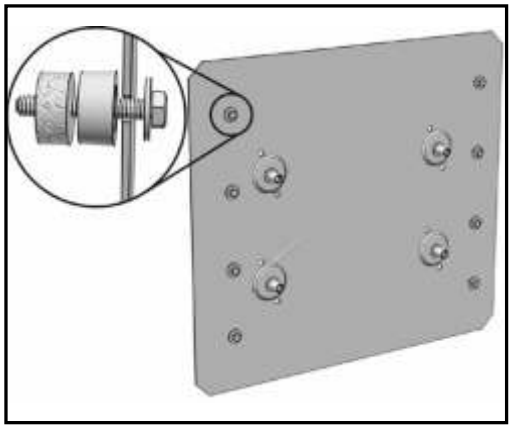
Introduce and affix the threaded rivets provided.
For neoprene rivets insert them (manually) up to the brim. Then adjust the screws.

Install the water tank support plate to the cabin taking into account that there must be a separation of 10 mm. between the plate and the cabin. Use the spacers provided.

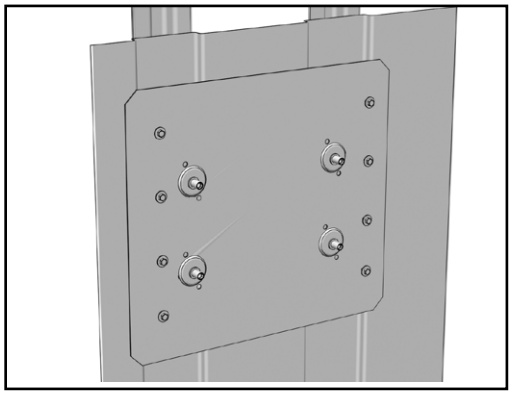
Place the polyester foam washers in order to avoid water or humidity filtrations.

Important: *Use adequate separators to compensate uneven surfaces.*

Before attaching the support plate to the cabin, set the tank's fixing screws and washers provided.

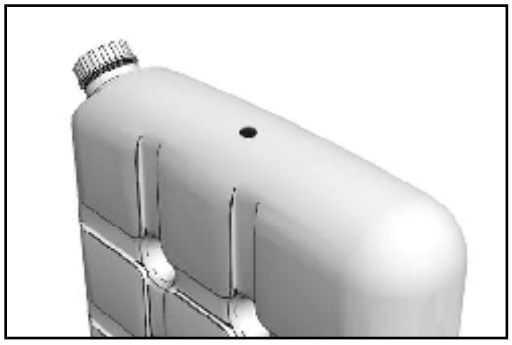


Attach the support plate firmly.

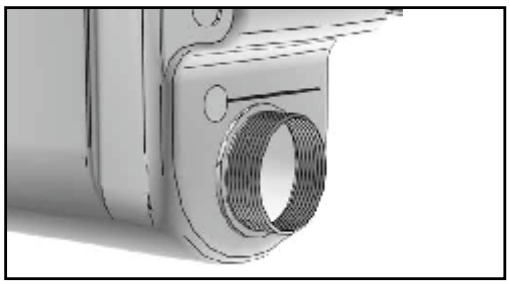


When using the water tank on vertical position; you have to make 3 holes of 22 mm. in diameter. Plug original holes with provided plugs.

- For venting: On the upper part of the tank and at its center.

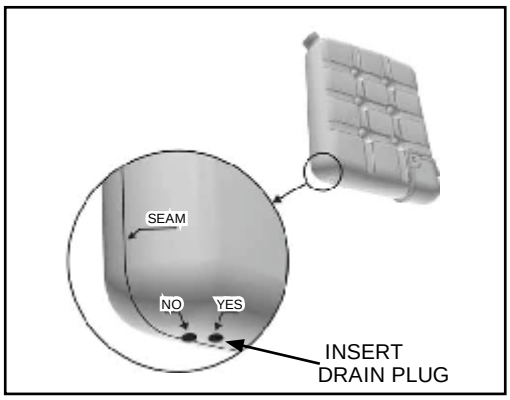


- For the level sensor: On one of the ends of the marked line where the water pump will be placed.



- For draining, at the bottom of the water tank and on the same side of the water tank cap.

Important: *Remove shavings.*

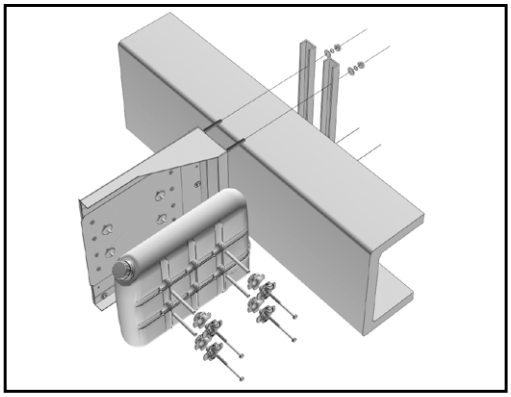


Place the water tank on the support plate and affix with the provided screws and washers.

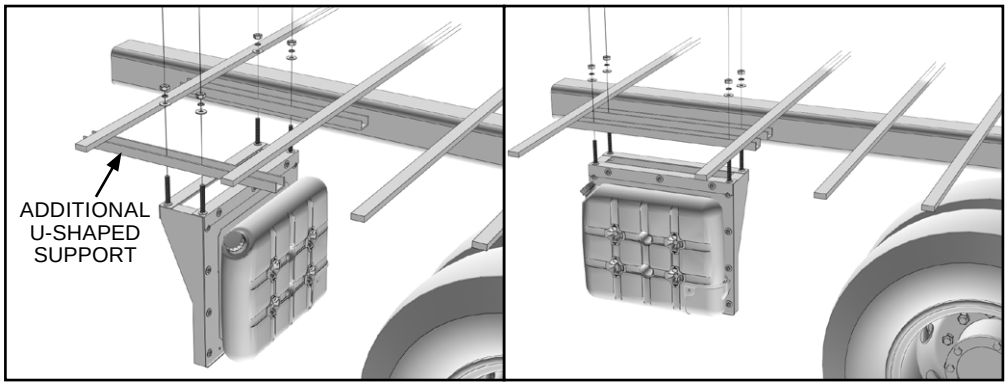
Once the tank has been installed, cut the cord from the evaporator containing hoses and wires. See electrical and hydraulic diagrams in order to assess their length.

2.7 - WATER TANK SUPPORT (OPTIONAL)

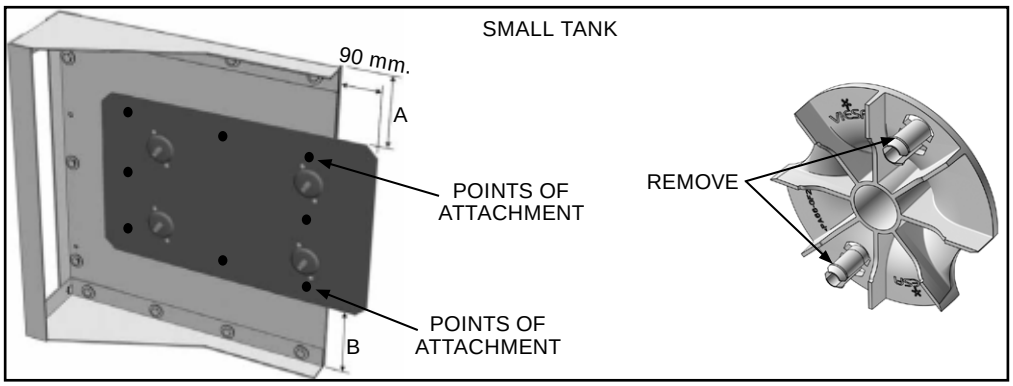
Depending on the vehicle, the water tank support can be placed parallel or perpendicular to the chassis frame.
Never drill the frame's flange.

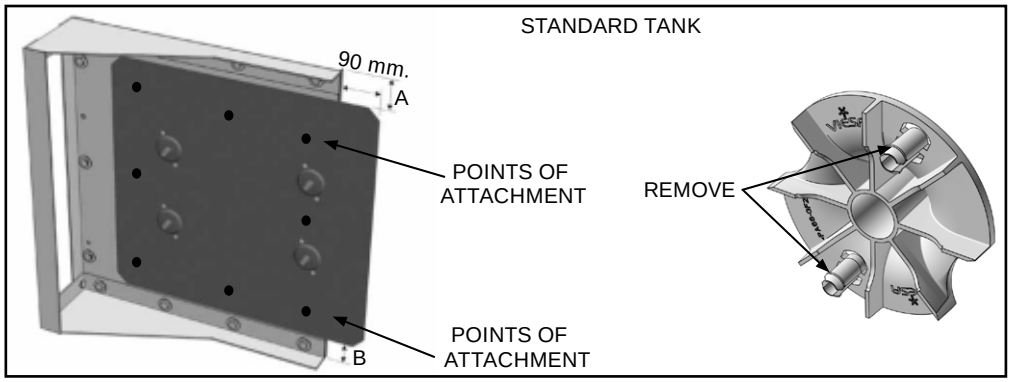


Additional "U" channel pieces may be necessary.



Important: distances A and B must be equal.

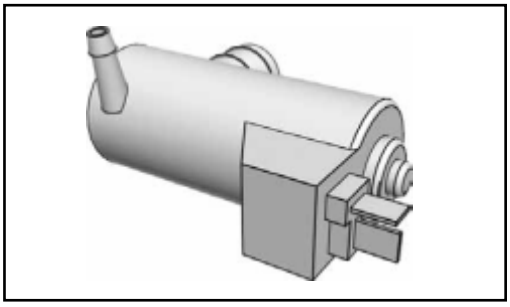




2.8- WATER PUMP

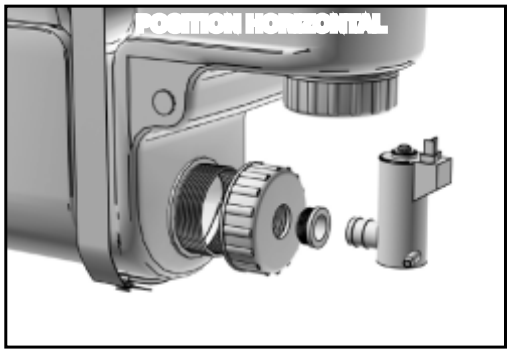
Technical Characteristics

a) Centrifugal
b) Consumption in 12 volts: 3.1 A.



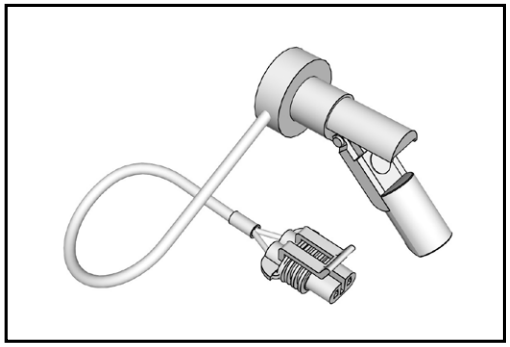
Installation

Place the water pump in vertical postilion.
Insert the pump's nipple into the water tank cap with hole.
Use the rubber gasket.



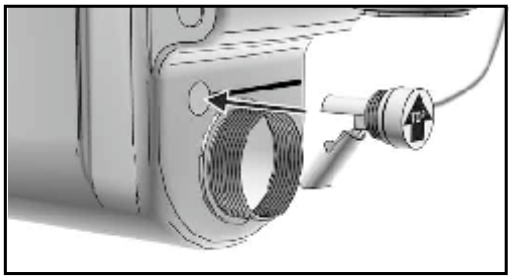
2.9- LEVEL SENSOR

Controls the water pump operation.



Introduce the level sensor according to the figure.
Keep the marked arrow “UP”.

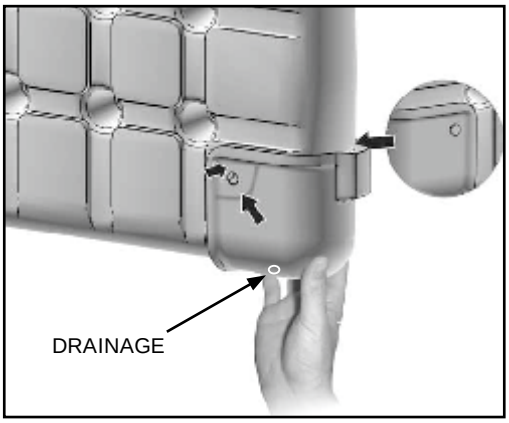
Use the provided rubber gasket.



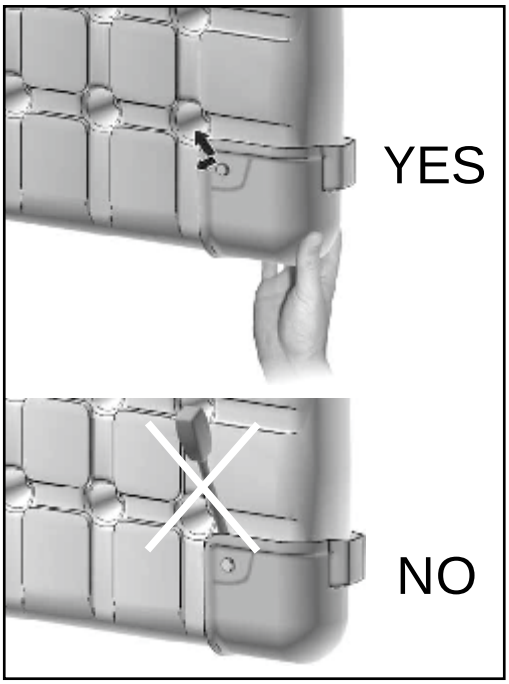
2.10- WATER PUMP COVER

To place the water pump cover insert first one of the holes in the water tank pin an then, manually, insert the second hole.

Note: *Make sure not to obstruct the water pump cover draining hole. If necessary, make an additional hole.*

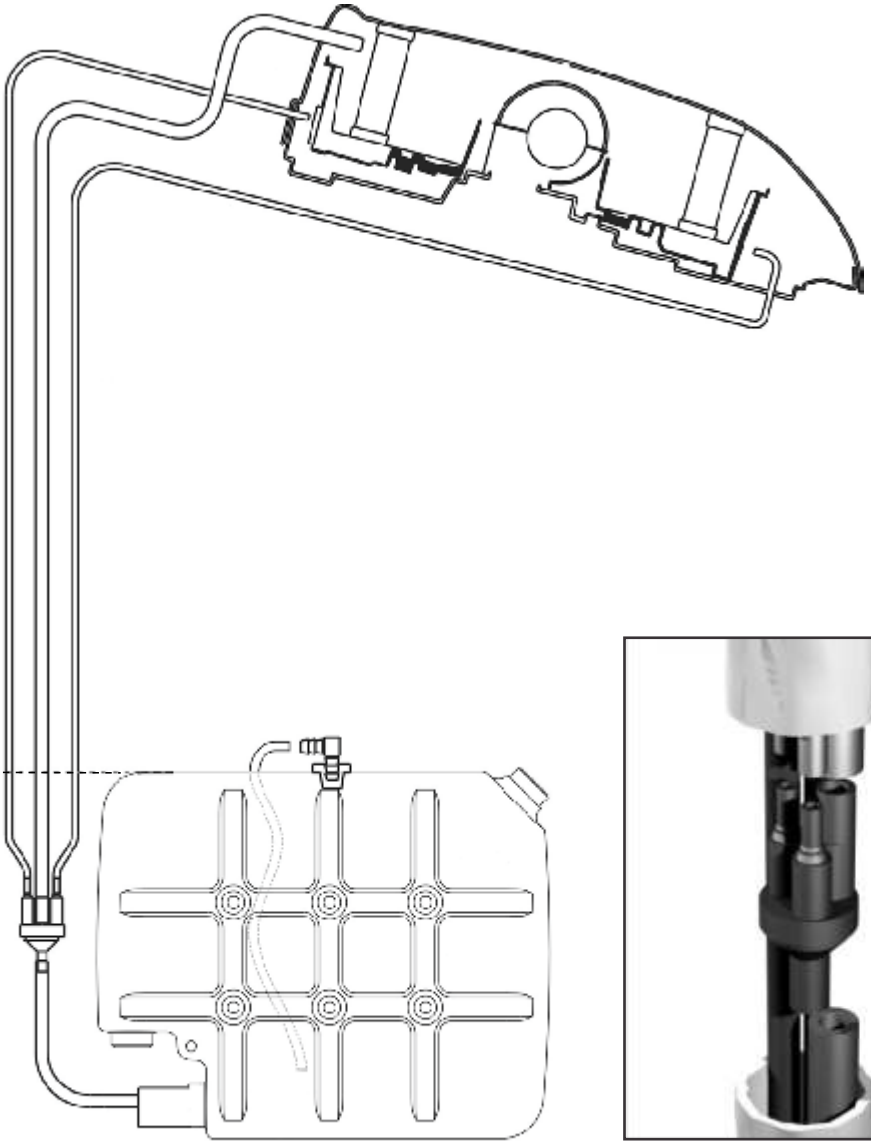


Important: *Don't use tools to remove the water pump cover.*



3- CONNECTIONS

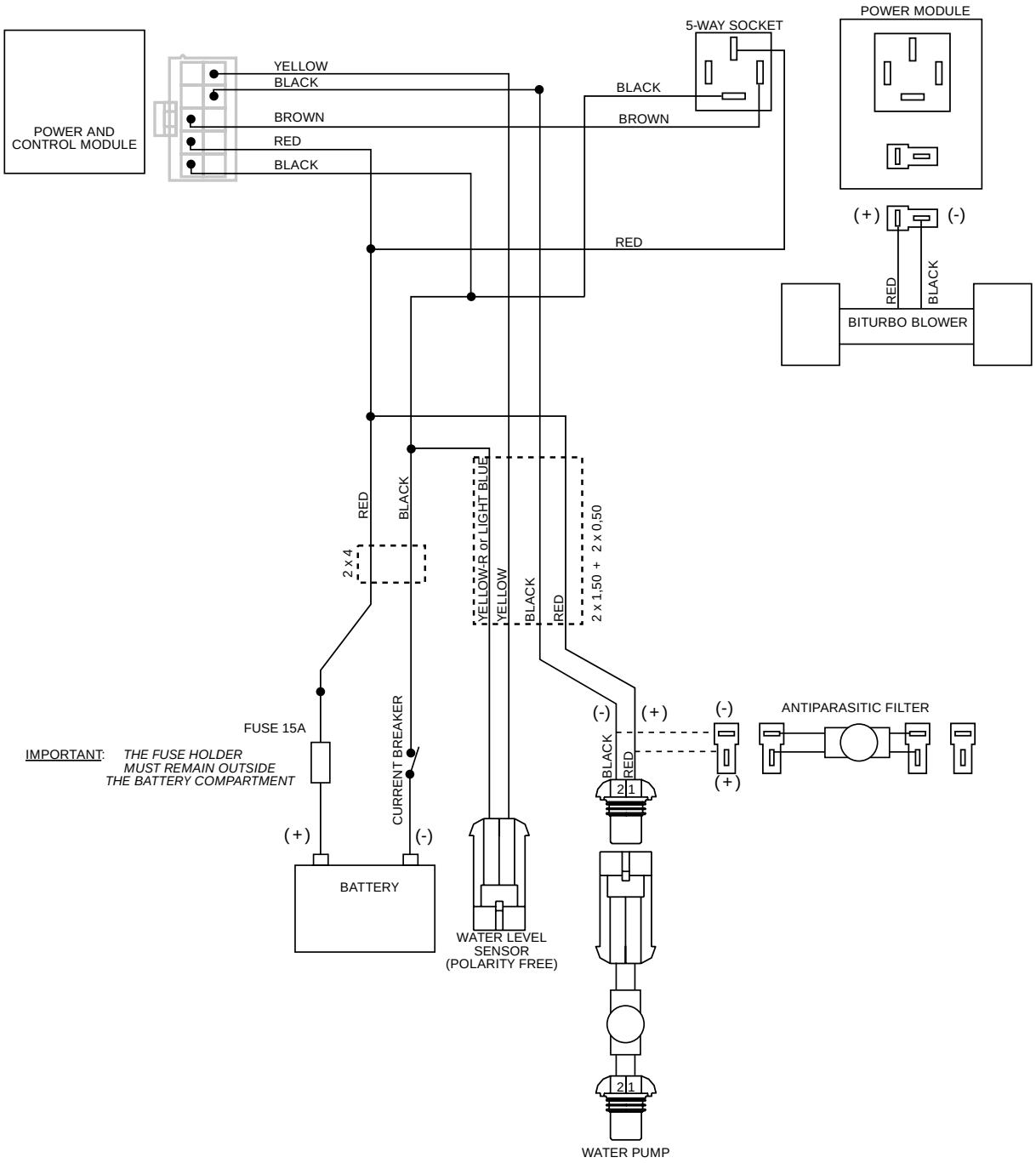
3.1- HYDRAULIC


THIS VALVE MUST BE
INSTALLED BELOW THE
THE UPPER EDGE OF THE
WATER TANK.
IN TILT CABINS
OR WATER TANKS INSTALLED
ON THE TRUCK CHASSIS
THE VALVE MUST BE INSTALLED
AT MORE THAN 1 M BELOW
THE EVAPORATOR'S LOWER EDGE.

Note: *cut the tubes accordingly. The grey cord wrap must cover all the hoses and wires until it reaches the pump cover.*

Important: *to install the elbow (for ventilation) in the tank, make a 22 mm. diameter hole in the center of the top the tank (remove shavings). Use the elbow provided.*

3.2- ELECTRICAL



⚠ Very Important: *The fuse must be installed at the end.*

Important: *In ADR (dangerous goods Transportation), encase and protect the electrical wiring in approved fire-proof material.*

Note: *use the provided wire terminals, terminal covers and sockets. Solder wire terminals and / or joints with tin.*

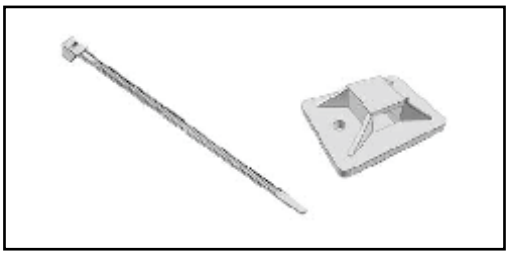
The connection of the pump and level sensor must remain inside the pump cover.

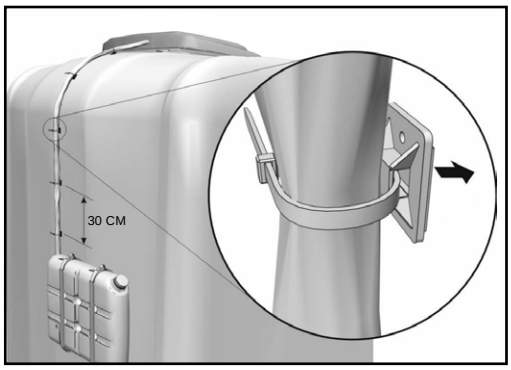
Important: *the positive cable (+) is the last element to be connected.*

ATTACHING THE ELECTRICAL AND HYDRAULIC CONNECTIONS

Use the self-adhesive tie bases and plastic ties provided to attach the electrical and hydraulic connections from the evaporator down to the water tank.

Note: *Clean the surface where the adhesive will be placed.*

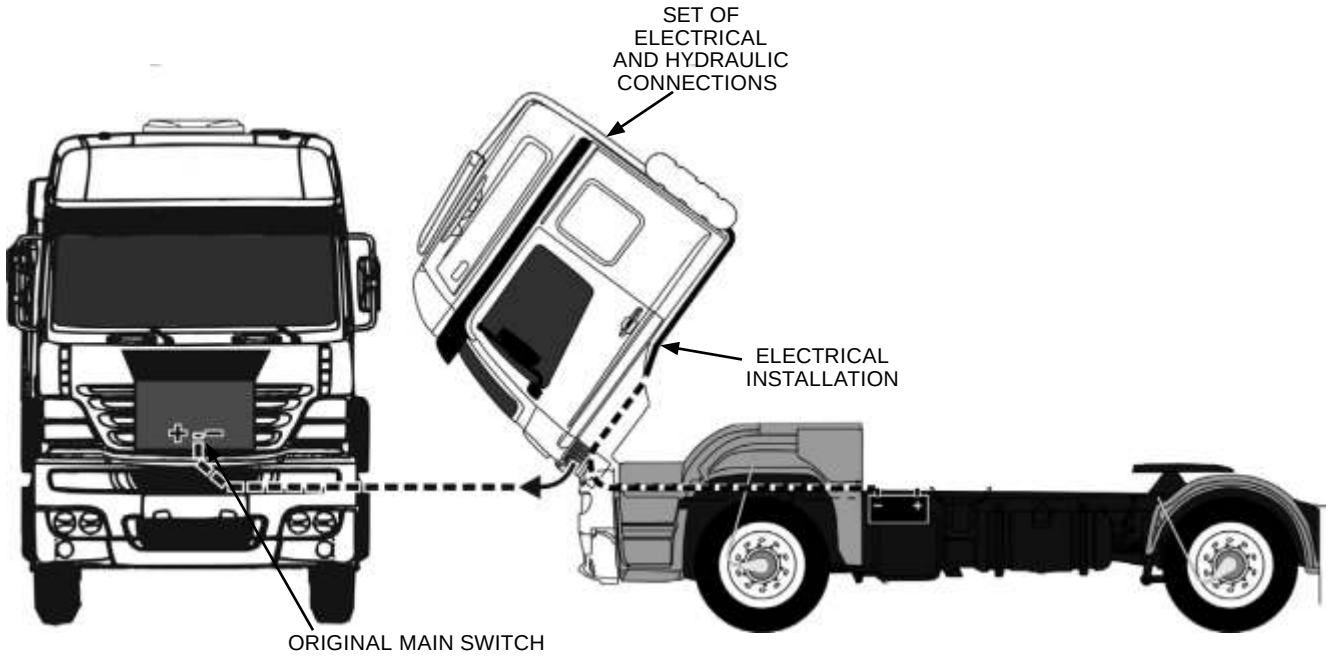




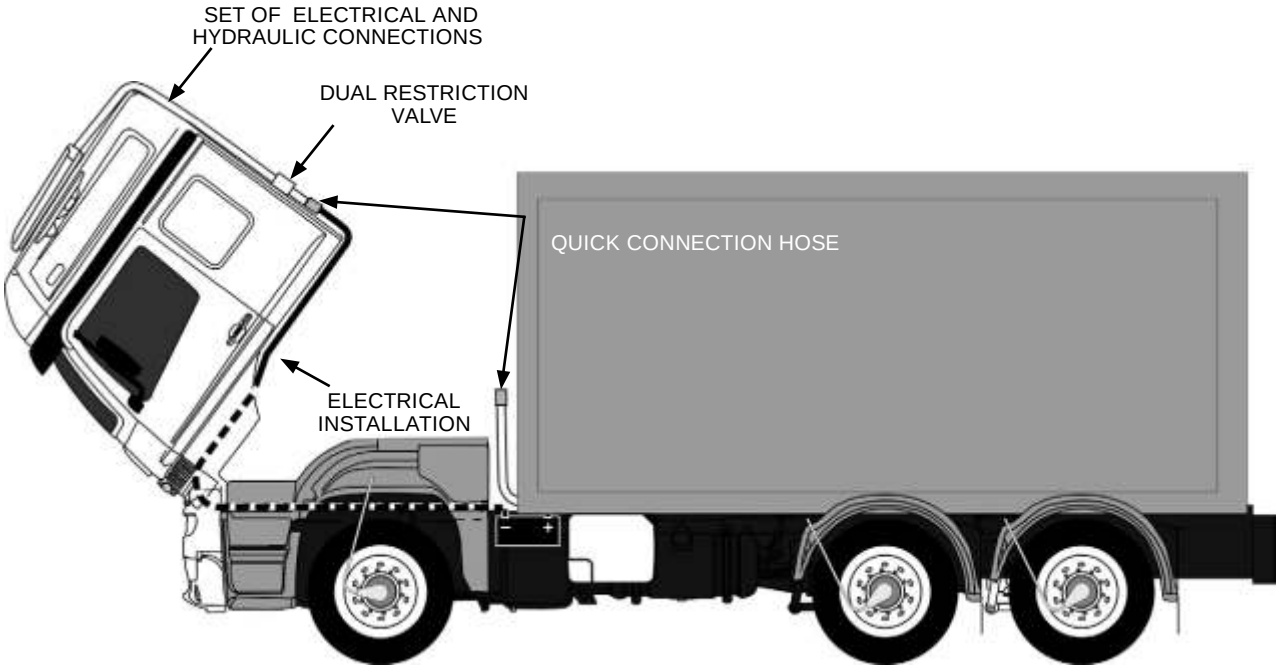
4- UNITS WITH TILT CABINS

a) With Water Tank Applied to the Cabin.

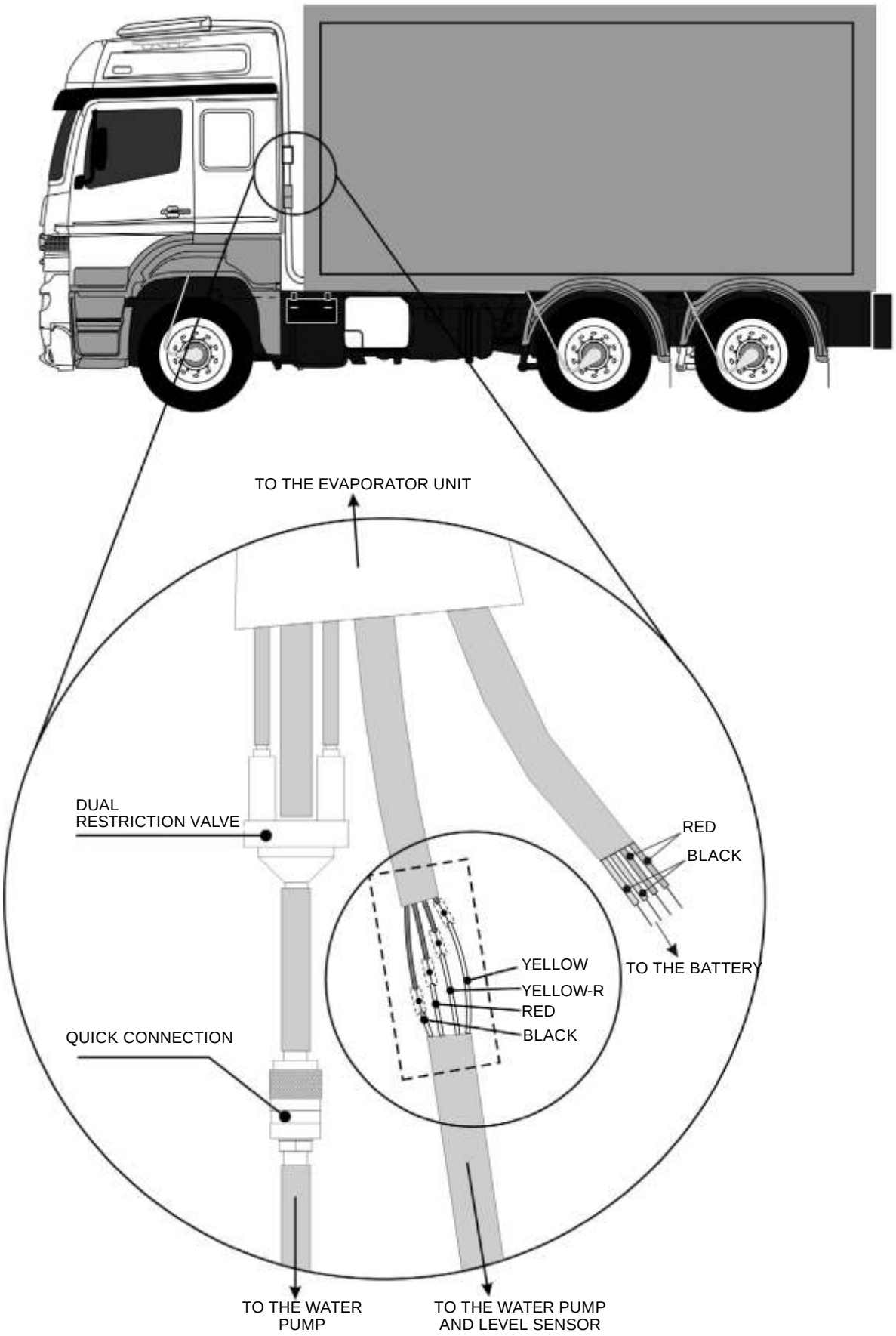
Note: *The power supply must be direct from the battery or the main switch.*



b) With Water Tank Applied to the Chassis



Wires to the water tank and battery must be extended. See detail below.



5- RECOMMENDATIONS TO THE INSTALLER

- Wet the evaporator immediately after installation in order to fast start cooling.
- Clean the working area.
- Provide the owner with the Viesa User's Manual and warranty information.
- Explain the user the operation and maintenance of the equipment in detail.
- Explain to the user that, BEFORE SWITCHING ON THE UNIT one window must have a 3 cm opening and all other vents must be closed. This opening will allow hot air to be expelled from the interior.

6- GENERAL MAINTENANCE

The equipment will delay in cooling until the evaporator is totally wet.
Do not use fuses higher than 15 Amp.
The equipment will deactivate automatically due to low tension so as to prevent damages to the battery.
Use only clean water.
Foresee replenishment of water taking into account that the equipment consumes between 2 and 5 litres per hour depending on the ambient temperature.
During short stops leave the equipment on so as to keep the cabin fresh.
System must be turned off when exhaust fumes or toxic particles could enter the cab through the system.

⚠ When performing maintenance of the equipment or if the evaporator unit's cover or the upholstery cover are removed, the system MUST NOT BE SWITCHED ON and you must not switch it on with any of these elements removed.

Keep the tank clean. Every 200 hours of use

- Drain all the water from the tank by removing the drain plug.
- Rinse with clean water thoroughly.
- Pour one bottle of Viesa Scented Cleansing Fluid.
- Fill-up the tank with clean water.

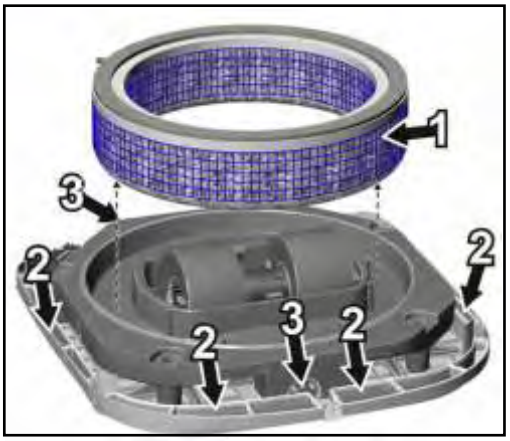
Each 6 months change the package of granulated Calfa Bas crystals.
Do not use chemical products to clean the control panel.

VIESA SCENTED FLUID (EVERY 200 HOURS OF USE)

GRANULATED CALFA BAS EACH 6 MONTHS

Every 2 months or according to working conditions:

- Submerge the evaporator in water with bleach (1).
- Clean the grids of the air entrances (2).
- Clean the filter of the collector tray (3).



Reconnect water returning hose to the filter of the collector tray according to the figure.

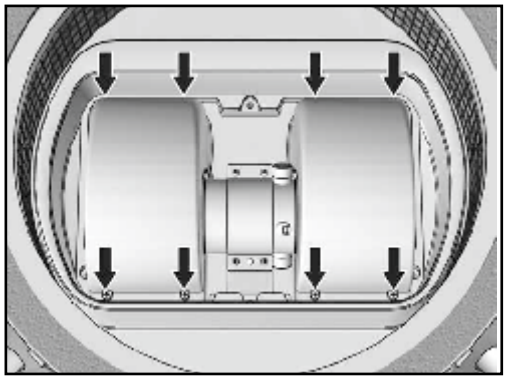
7- REPLACEMENT OF THE MAIN COMPONENTS

REPLACEMENT OF THE MOTOR OF THE BITURBO BLOWER

Remove the cover of the evaporator unit fixed with 5 screws.

Remove the evaporator.

Remove the two turbines' covers taking away the 8 screws.

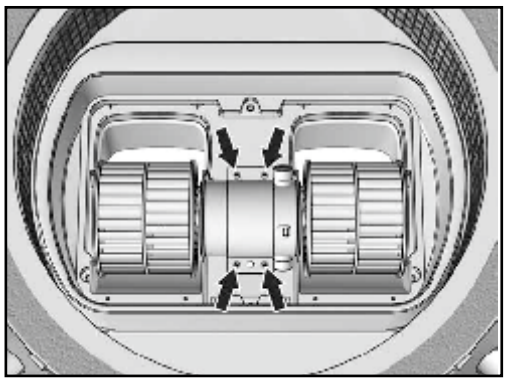


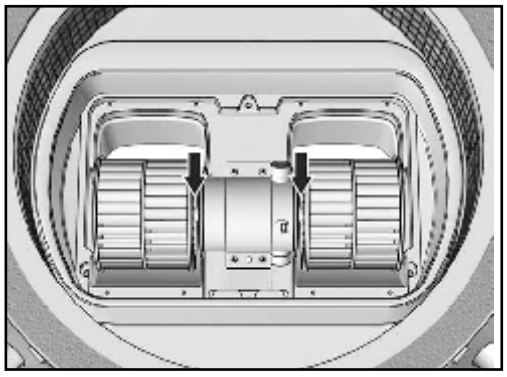
Remove the 4 screws of the blower mounting bracket and remove it.

Replace the motor making the corresponding electrical connection.

Put back the motor's mounting bracket and adjust.

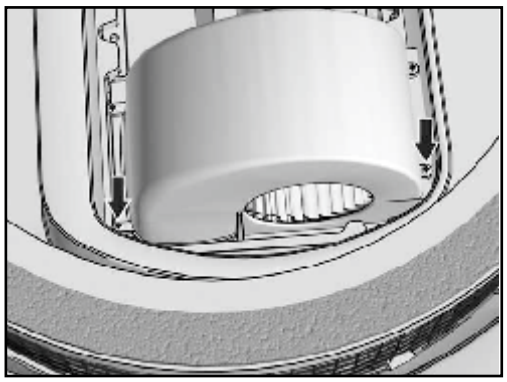
Important: *Before tightening the bracket, center the motor correctly so that the turbines do not on rub the sides.*





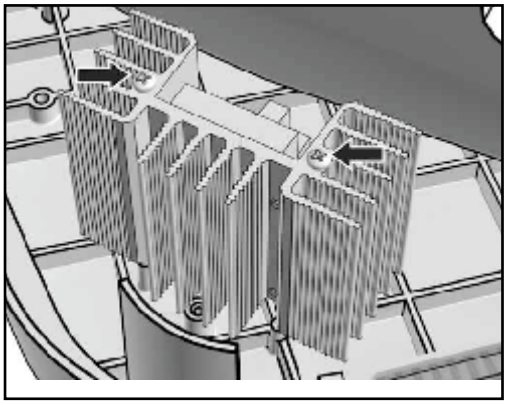
Put back the two turbine covers.

Place back and adjust the cover of the evaporator unit.



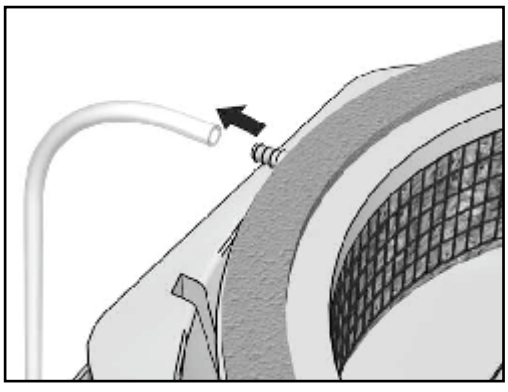
REPLACEMENT OF THE POWER MODULE

Remove the cover of the evaporator unit.
Remove the 2 screws holding the power module to the base.
Change the power module and reconnect.
Reinstall the cover of the evaporator unit.



REPLACEMENT OF THE EVAPORATOR

Remove the upper cover, after removal of the 5 screws.
Remove and replace the evaporator (disconnect reconnect the 9 x 15 cm hose).
Place back the upper cover fixing it with the 5 screws.



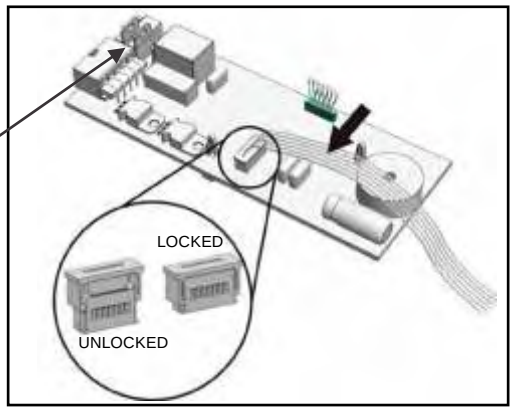
REPLACEMENT OF THE POWER AND CONTROL MODULE

Remove the air grilles and upholstery cover.

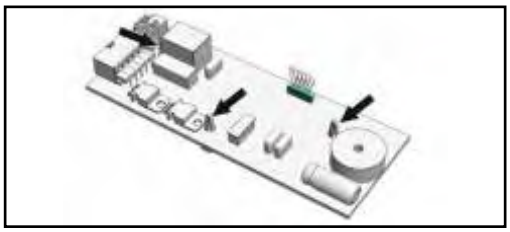
Disconnect the electrical installation and the ribbon cable from the module.

Remove the module unlocking the 3 locking pegs.

Locate the switch commanding the water cycle in the new module and set it. (See Water Cycle Setting before)



Put the new command and control module to the upholstery cover inserting the 3 locking pegs into their holes. Insert the ribbon cable as indicated in the figure (raise the connector head first, introduce the ribbon cable and then push down the connector head to lock).



Reconnect the electrical installation to the module.

Put back air grilles and upholstery cover.

8- FAILURE LOCATION GUIDE

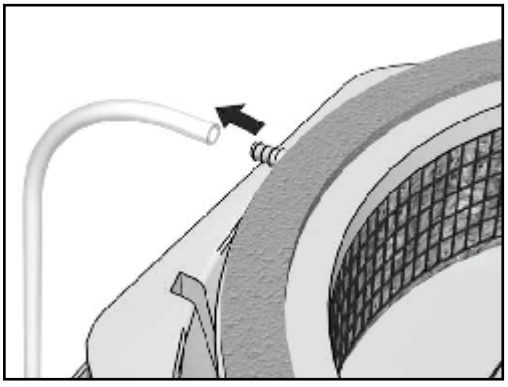
EQUIPMENT WITH LOW EFFICIENCY

Check:

WATER PUMP PERFORMANCE AND ELECTRICAL CONNECTIONS

a) Remove the upper cover.

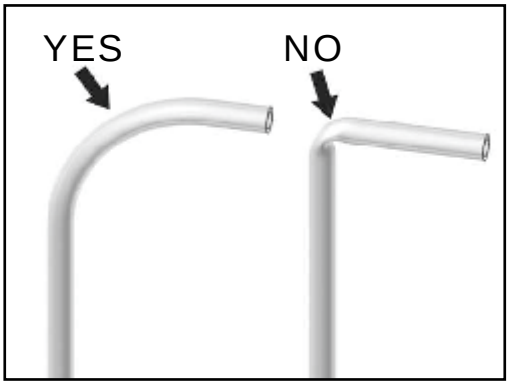
b) Remove the water hose from the evaporator.



c) Using a container with a cm^3 scale on it, turn on the pump and collect the water for one cycle, which should be between 800 cm^3 (minimum) and 1500 cm3 (maximum).

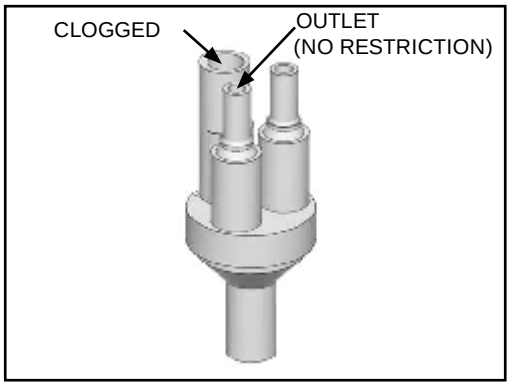
<u>If the water collected is below the minimum, check that:</u>

The evaporator hose is not obstructed, bent or kinked.



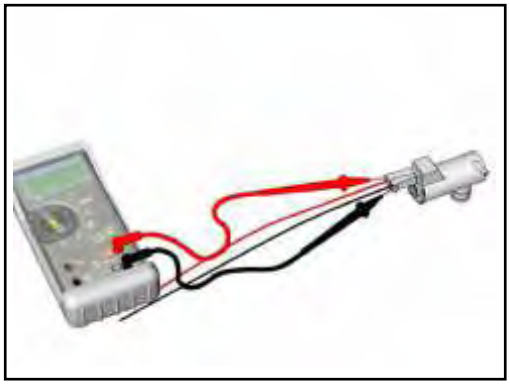
The switch commanding the water cycle is properly set.
(See Water Cycle Setting before)

The restriction valve is not clogged and that water flows freely trough the outlet.



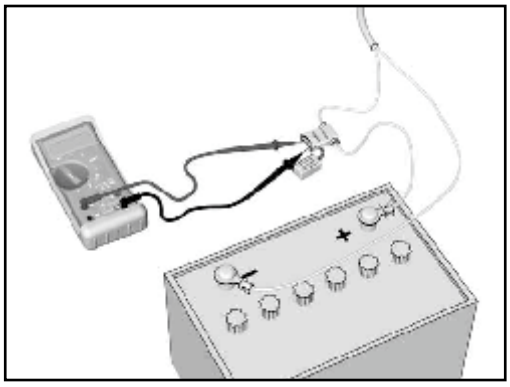
The water pump supply voltage is correct: 9.8 V minimum.

Important: *Measure at the pump's connector with the pump working and the turbo blower at maximum speed.*

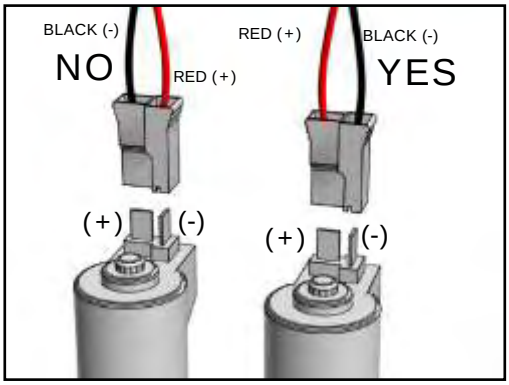


The water pump consumption (Amp) is between the specified values: between 2.0A and 4.0A (with water running through).

Important*: Remove the fuse and measure at the fuse box while the pump is running and the biturbo blower is off.*

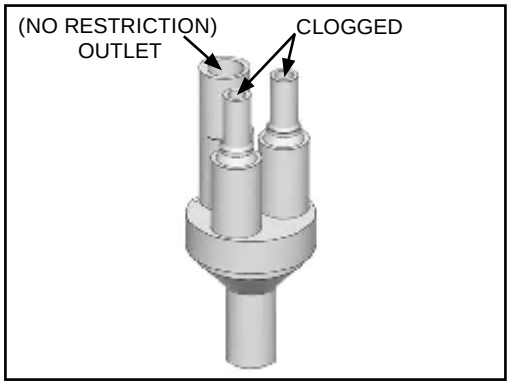


The water pump electrical connections are correct.



If the water collected is above the maximum, check that:

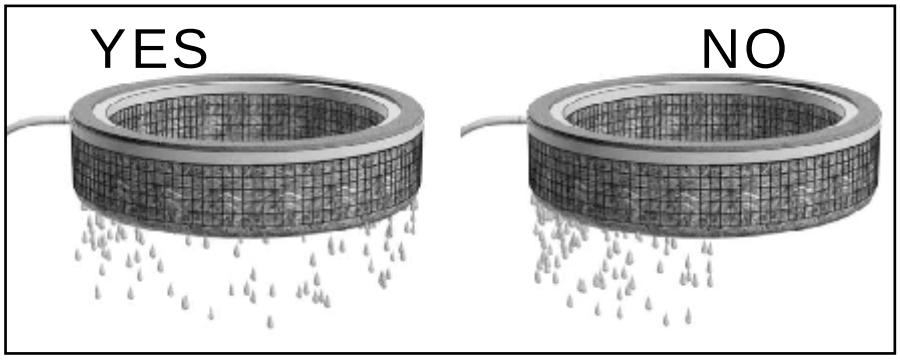
The restriction valve is not clogged and that water returns freely trough the outlet.



The switch commanding the water cycle is properly set.
(See Water Cycle Setting before)

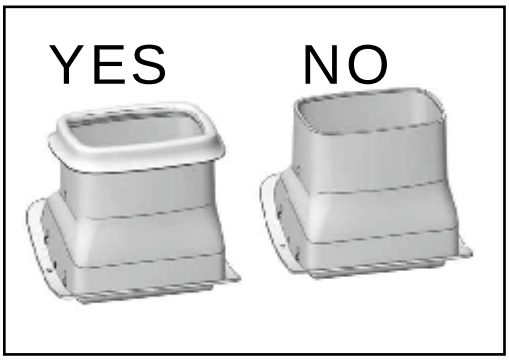
EVAPORATOR ASSESSMENT

Manually pull up the evaporator and with the water pump working, check that water is distributed evenly around the evaporator.

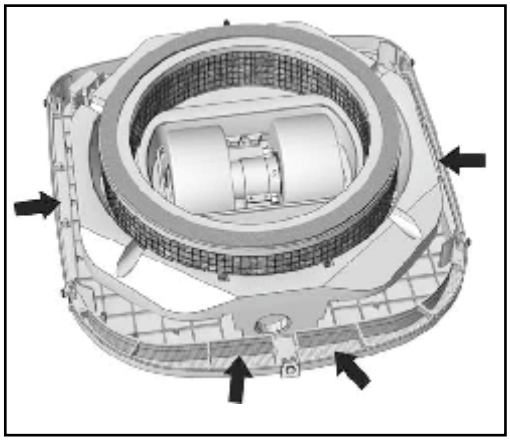


VENTILATION

Check that the air grilles have their weather strips.

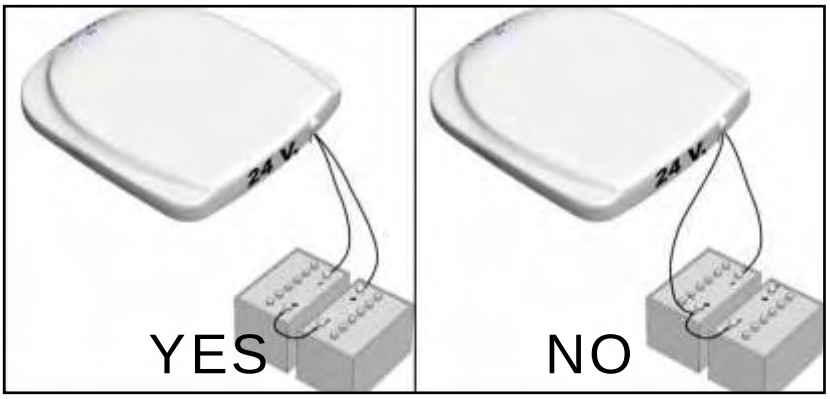


Check that the air intakes are not obstructed.

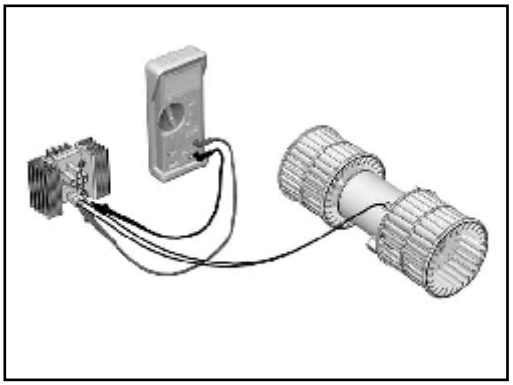


Verify that the evaporator is not dirty or lacking wooden chips.

Verify that electrical connections are rightly performed.



Verify the biturbo blower input voltage: 9.5 V minimum.



Important: *Measure at the biturbo blower pins and when it is working and the water pump is working.*

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
The indicators are ok, but the equipment has low efficiency.	HYDRAULIC	HYDRAULIC
	1- Inverted electrical connections of water pump/s.	1- Connect correctly: Red (+) and black (-).
	2- Evaporator 9 x 15 cm hose blocked.	2- Modify.
	3- Evaporator placed upside down	3- Place the evaporator with the hose connector upwards.
	4- Blocked holes at the water distributor of the evaporator.	4- Replace the evaporator.
	5- Dirty evaporator.	5- Clean and/or replace the evaporator.
	6- Water pump damage.	6- Replace the water pump.
	7- Faulty power and control module.	7- Replace the power and control module.
	8- Water Cycle Switch with wrong setting.	8- Reset Water Cycle Switch according to water column height.
	VENTILATION	VENTILATION
	9- Air grilles without weather strips.	9- Put strips to the air grilles.
	10- Blocked air entrances of the base of the unit.	10- Clean the air entrances.
	11- Faulty blower.	11- Replace the motor of the blower.
When the equipment is on, water enters by the air grilles and/or it spills through the ceiling.	1- Incorrectly oriented holes of the water distributor of the evaporator.	1- Replace the evaporator.
	2- Blocked dual restriction valve.	2- Clean or replace the valve.
	3- Blocked return hoses.	3- Clean hoses or change path.
	4- Blocked PVC filters in the evaporator's tray.	4- Clean PVC filters.
	5- Water column less than 40 cm.	5- Place the tank lower.
	6- Water Cycle Switch with wrong setting.	6- Reset Water Cycle Switch according to water column height.

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
The equipment works well, but the fuse burns out continuously.	1- Short-circuit in the blower or in its connections. 2- Short-circuit in the water pump or its connections. 3- Damaged power wire.	1- Replace the blower or repair. 2- Replace the water pump or repair. 3- Locate, repair and seal correctly.
Water pump operation not showing on display. *(blower works at one speed only)*	1- Inverted electrical connections to battery. 2- Faulty power and control module.	1- Connect red wire to + black to - 2- Replace the command and control module.
Power module burns out.	1- Seized biturbo blower.	1- Replace biturbo blower motor.
Pump cycles are not right ones.	1- Water Cycle Switch with wrong setting.	1- Reset Water Cycle Switch according to water column height.
Blower at its maximum speed cannot be turned off.	1- Faulty power module.	1- Replace the power module. Check the free spinning of the blower.
Blower works, display shows normal operation but the pump doesn't work.	1- False contact and/or disconnection of the ribbon cable. (control and command module) 2- False contact and/or disconnection of the water pump. 3- Faulty control and command module. 4- Faulty water pump.	1- Repair and/or connect. 2- Repair and/or connect. Tin terminals of the water pump. 3- Replace the control and command module. 4- Replace the water pump.
The speeds do not match the display indications or they do not change.	1- Faulty blower. 2- Humidity or water in the power module's terminals. 3- Faulty power module.	1- Replace the motor of the blower. 2- Clean and seal. Check condition of evaporator. 3- Replace the command and control module.

INSTALLATION MANUAL VIESA ECON

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1-2012

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